

# FLIGHT

&  
*The AIRCRAFT  
ENGINEER.*

First Aero Weekly in the World.

Founder and Editor : STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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## Flight

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NOTICE.—With this issue is published a double-page picture, "The Return Match," after an original drawing by Joseph Simpson.

## EDITORIAL COMMENT.

"Newspapers are an essential part of our war organisation."  
(Sir Auckland Geddes, Minister of National Service.)



VEN though to all appearance the end of the war is almost in sight, on the sound principle that we dare not relax our effort until the Hun has confessed himself beaten and expresses himself ready to accept the only terms we have to offer him, the appeals for recruits to the various women's war organisations are still being insistently made. The W.R.A.F., the W.R.N.S. and the W.A.A.C. ask for more patriotic

Recruiting for the W.R.A.F. women to enrol in their ranks. Naturally, the interests of "FLIGHT" in connection with this recruiting campaign are centred mainly upon the W.R.A.F.

Recently we have had occasion to criticise in strong terms the methods adopted in the selection of officers or this organisation and the conditions under which

in certain cases the members are called upon to work. We see no reason to withdraw a single word of the criticisms we have passed in this matter. It was only after the fullest investigation of the cases brought to our notice that we took up the question, and we are as fully convinced as ever that we wrote nothing but what was completely justified by the facts. We explain this in order that there should be no misapprehension on account of anything we may say subsequently.

The authorities of the W.R.A.F. are aware that all has not been as it should, and are, we are exceedingly glad to learn, taking all possible steps to improve the Service and remove abuses. As they point out with a considerable show of reason on their side, the W.R.A.F. is a new service, which has had to be created out of a mere nucleus, and it is almost inevitable that there should be shortcomings to begin with. That is doubtless true, but we still remain of the opinion that if the obvious measures which are now being taken had been adopted at the start—as they might well have been, seeing that the experience of the two older organisations was on record—a good deal of trouble would have been saved and a lot of heart-burning avoided. Moreover, the Service would have been more popular than it seems to be at the moment. However, matters have been seriously taken in hand, and a very great improvement is to be looked for in the immediate future. As to what changes are to be made in the manner in which women are selected for commissioned rank we do not know at the moment exactly what has been decided upon, but we understand the system is receiving serious consideration and that changes are likely to be made in the near future which will remove anomalies and ensure that none but the most suitable candidates shall become officers of the Force. Then, as to the conditions at air stations at which details of the W.R.A.F. are employed, and about which we have received many letters of complaint, an Inspection Board has been appointed for the purpose of visiting all such stations, in order to report upon conditions and recommend changes where they seem to be desirable or necessary. As a matter of personal knowledge, we are assured that Headquarters is really alive to the necessity of making the Service as attractive as possible, in order that there shall be the greatest inducement for the right kind of members to join.

In the light of what is being done, and assured as we are that the determination exists at Headquarters

to make the W.R.A.F. a really efficient and contented Force, we do not hesitate to back the appeal for more recruits to its ranks. Now, when we have got the enemy on the run, and it is essential that we should exert our maximum effort in the field to turn defeat into rout, we want every single man, who can be released from such tasks as can be performed by women, in the ranks of the fighting men. Every woman who comes forward now to release a man for the Front is doing the right thing, even though it may turn out that the end is not as far off as it might appear, and from the individual point of view of "FLIGHT" she is doing doubly well to join the W.R.A.F. There is just this that we would say to the prospective candidate for membership of the Force. The latter is a War organisation, and its members join it in order to relieve the strain on our man-power by undertaking work which in very many cases has hitherto been regarded as men's work. Often that work may have to be done under conditions which seem like hardship. Generally there is inconvenience at least attached to it. Again, a proportion of those who join these military organisations have a very imperfect idea of what it means to live under military discipline, and the realisation is something different to their anticipations. These things cannot be helped, and it must so be realised by those who have made up their minds to enter the Service. In a word, they are undertaking War service in War-time, and they cannot expect all the amenities of the home at a station. There have been, as we have said, certain matters which required redress—matters altogether unconnected with the inevitable hardships and inconveniences of life on active service—to which we have directed attention previously. These are, we are assured, being taken in hand, and we are content for the time being to know that it is so.

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**The Sense  
of  
Security.**

A week or two ago a party of journalists was taken to the Handley-Page works to see how the modern battle-plane is made, and a number of them were afterwards given flights in up-to-date machines. To all appearance this is quite an ordinary event. A certain number of people are taken over a factory; a proportion are then taken for an aerial joy-ride, and then everybody goes off to lunch, feeling excellently pleased with themselves. But in this case the effects go a great deal deeper than that. They are visible in what has been written since. Some have written articles in the flamboyant reportorial style, excellently descriptive of the sensations—real or supposed—of the dare-devil aviator. These do not take us very far, nor do they assist much towards the future development of aviation. Indeed, they produce an exactly reverse effect, since the very last impression it is desirable to convey is that there is any devil to be dared. Some, on the other hand, appear to have regarded their experience in a different light, and have set down their impressions from the point of view of the security of flight. These all seem to agree that it was the sense of security and stability which impressed them most and which is likely to most impress the public upon whom so largely depend the future success of commercial aviation.

Writing some weeks ago on the subject of commercial aviation after the War, we said that in spite of the enormous strides which have been made in the construction, safety and reliability of the aeroplane

during the past four years, we are still a long way from the time when we can expect the travelling and business community generally to trust itself, either in person or for the purposes of commercial traffic, to the aeroplane. Before that stage of development can arrive we shall have to carry out a lot of propaganda work, and we can imagine nothing better in this direction than that the responsible Press of the country should be given opportunities of realising that aviation as a method of travel is as easy and as safe, as well as being infinitely more rapid, as locomotion on *terra firma* or by sea. There is nothing like actual demonstration, which teaches more in a single lesson than can be imparted by dozens of lectures and reams of written articles. We do not forget that the popularisation of the motor car was due in no small measure to actual demonstration in this way. We can most of us remember when people who have long been numbered among the great army of car users and owners refused to trust themselves to the vehicle which they regarded as an impious contraption, and steadily maintained their opposition to the new locomotion until their prejudice and fear were broken down by the propaganda of demonstration. So it will be in the case of locomotion by aeroplane. Every one regards the aeroplane as a wonderful instrument of war and a marvellous development of science. The majority would agree that it is a reasonably safe vehicle of locomotion when in expert hands. The minority which knows realises that it is, indeed, an absolutely safe vehicle, which, for the comparatively simple purposes of peace, can be easily flown by an average person. But it is the majority we have to convert from the passive state of acknowledgment of reasonable safety to the active belief which will impel it to use the aeroplane in its lawful occasions. We believe that no better means can be found, initially at any rate, of helping on that conversion than a set programme, to be started when peace comes again, of such demonstrations as that which took place Hendon-way the other day. When a responsible member of the staff of every influential journal in the country has been in the air and has been impressed with the security of flight, we shall have gone a very long way towards the breaking down of the fear and prejudice that will undoubtedly stand in the way of the first development of aviation as a commercial enterprise. The idea may not appeal at first sight to every one in the industry, but we are quite confident that, if they will take the trouble to think it out, they will see that such an organised plan of propaganda would do more to further the interests of commercial aviation than any other kind of publicity campaign that could be devised.

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**Why There  
Cannot  
be an  
Armistice.**

All the talk now is of peace. The Hun is rapidly being dispossessed of the areas of France and Belgium he occupied more than four years ago, and is making a desperate attempt to secure some sort of a peace that will relieve him of his consequent liability for the damage he has done to the territory and the atrocities to which he has subjected the peoples of the Allied countries. So far his insidious attempt to secure the advantage of a suspension of hostilities has been met with the contempt it deserves. He has been referred to the only competent authorities, who are the commanders of the Allies' armed forces, and we know what they are likely to say—if

they are left alone to answer as they deem proper. There is, however, one aspect of the suggestion for an armistice which seems to have escaped general attention, and that is that any suspension of hostilities pending peace negotiations is a matter which affects the war by sea equally with the land war. Naturally the enemy has carefully refrained from raising the naval issues. He has more or less indefinitely subscribed to the demand for the evacuation of occupied territories and the giving of guarantees for the due performance of the subsequently determined peace terms, but there has been no word yet as to naval guarantees. Yet it is absolutely vital to us that the Hun should not be able to take advantage of an armistice to secure a more favourable position at sea than he occupies at present, and that we should not present him with a lever to be used against us in the final peace negotiations, presuming that there are such negotiations. It must not be forgotten that once the fighting is stopped there is no more than an outside possibility of hostilities being resumed, and that therefore the terms of the armistice will be very largely those of the subsequent peace. Now, it is unthinkable that we can allow the Germans the continued possession of the second fleet in the world—a fleet whose power has been prostituted to the most unholy uses during the war. If, then, the armistice which must almost as a matter of course be the preliminary to peace includes the only possible "guarantees" of the surrender of the enemy's armies ashore, the conditions must equally insist upon the surrender of his fleet and his submarine flotillas. Then there is the question of compensation in kind for the sinking of British and Allied tonnage during the war, and the only compensation to which we can listen is the confiscation of the whole of the German mercantile marine and its division *pro rata* to their losses among the Allies. If we leave that question open to discussion later we shall find ourselves headed off. The Germans

will know as well as ourselves that none of the present belligerent nations will want to take up the sword again, and are certain to try to bluff us on the knowledge. They will probably not succeed entirely, but it is beyond the shadow of a doubt that they would get better terms than as though they had begun with the loss by surrender of their navy and mercantile marine. To put the matter in the fewest words, the side which is in possession of the greatest and weightiest of accomplished facts will come best out of the ultimate conference, always, of course, assuming that we shall accept from the enemy something short of the utter humiliation of absolutely unconditional surrender. As to that we do not know what is likely to happen. The making of peace is a matter which concerns the politicians, and we do not trust them altogether. We do not like the silence which has been kept in this very matter of naval guarantees. Enquiry only elicits the somewhat nebulous answer that, in this case, the term "military" also includes naval, and we are told in the same breath that the question of armistice is one that rests entirely with Marshal Foch. To the plain British citizen it also looks like a question which very vitally concerns Sir Rosslyn Wemyss and Sir David Beatty. We think we know what their views as to necessary guarantees would be, but does the War Cabinet share them? We have heard a lot about our war aims, but the time has come now when we might hear a little about our peace aims. The Hun has got to know at some time or other the exact sum of the price he is to pay for his evil deeds, while this country, which has made unexampled sacrifices during the war, has a right to know from its spokesmen the terms they propose to accord. We have done with secret diplomacy—all the cards are, we are assured, to be placed on the table in future games—so let it be said at once that the irreducible minimum of our terms is already settled and what that minimum is.



Lisbon, as seen from a height of 2,000 metres.

(Photo, by Dr. Almeida Saraiva.)

## THE D.H.5 PURSUIT BIPLANE\*

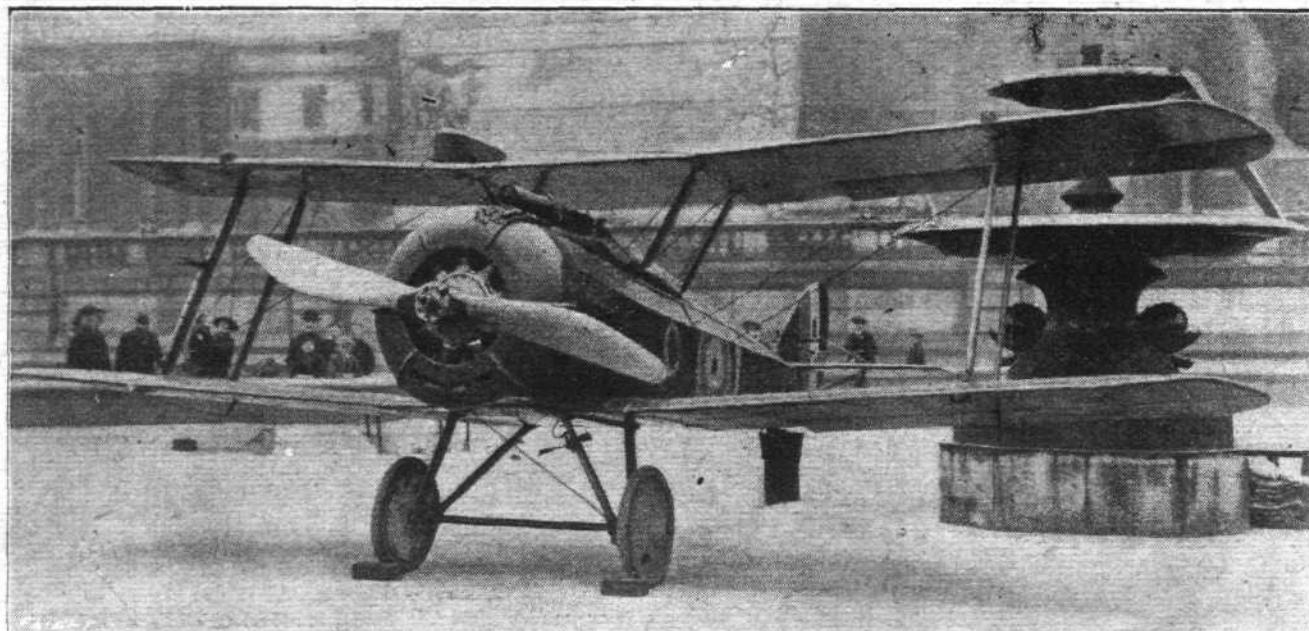
THE D.H.5 pursuit biplane herewith described was built by the Darracq Motor Engineering Co., Ltd., London, and bears the identification mark A 9435. It is a tractor biplane, with a single pair of interplane struts on either side and with the wings set at a negative stagger of 0.695 m.

Both wings have a span of 7.84 m. and a chord of 1.375 m. The upper wings are fixed to a centre section, while the lower are joined to wing roots at the height of the lower bottom longitudinals. There is no sweepback, but both wings have a dihedral of  $172^\circ$ ; the angle of incidence of the upper wing is  $2^\circ$  amidwings and  $2\frac{1}{2}^\circ$  at the tips, while that of the lower wing is  $2\frac{1}{2}^\circ$  throughout.

below in front of the leading edge, and above, over the front spar.

The body is of the ordinary four-longitudinal type braced by cross wiring, and is strengthened, in front, up to the pilot seat, and at the rear, underneath the tail plane, by a planking of 3 mm. plywood. Suitable formers give the body in front a neat circular cross section, the whole body being covered with canvas.

The undercarriage is of the V-type, with solid, streamlined wooden struts, and a continuous axle which rests between two auxiliary axles. The spring range of the axle is not limited in any way.



Three-quarter front view of a D.H. biplane on view at Trafalgar Square some months ago.

The wing spars are of spruce and of I-section. The ribs are spaced from 280 to 350 mm., and between each two ribs there are two false ribs, reaching from the leading edge to the front spar. The interplane and *cabane* struts are made solid of spruce, and the flying and landing stays are of streamlined wire.

Ailerons are carried on both wings, hinged to the rear spar.

### Side Elevation.

The control leads, of streamlined wire, run outside the planes,

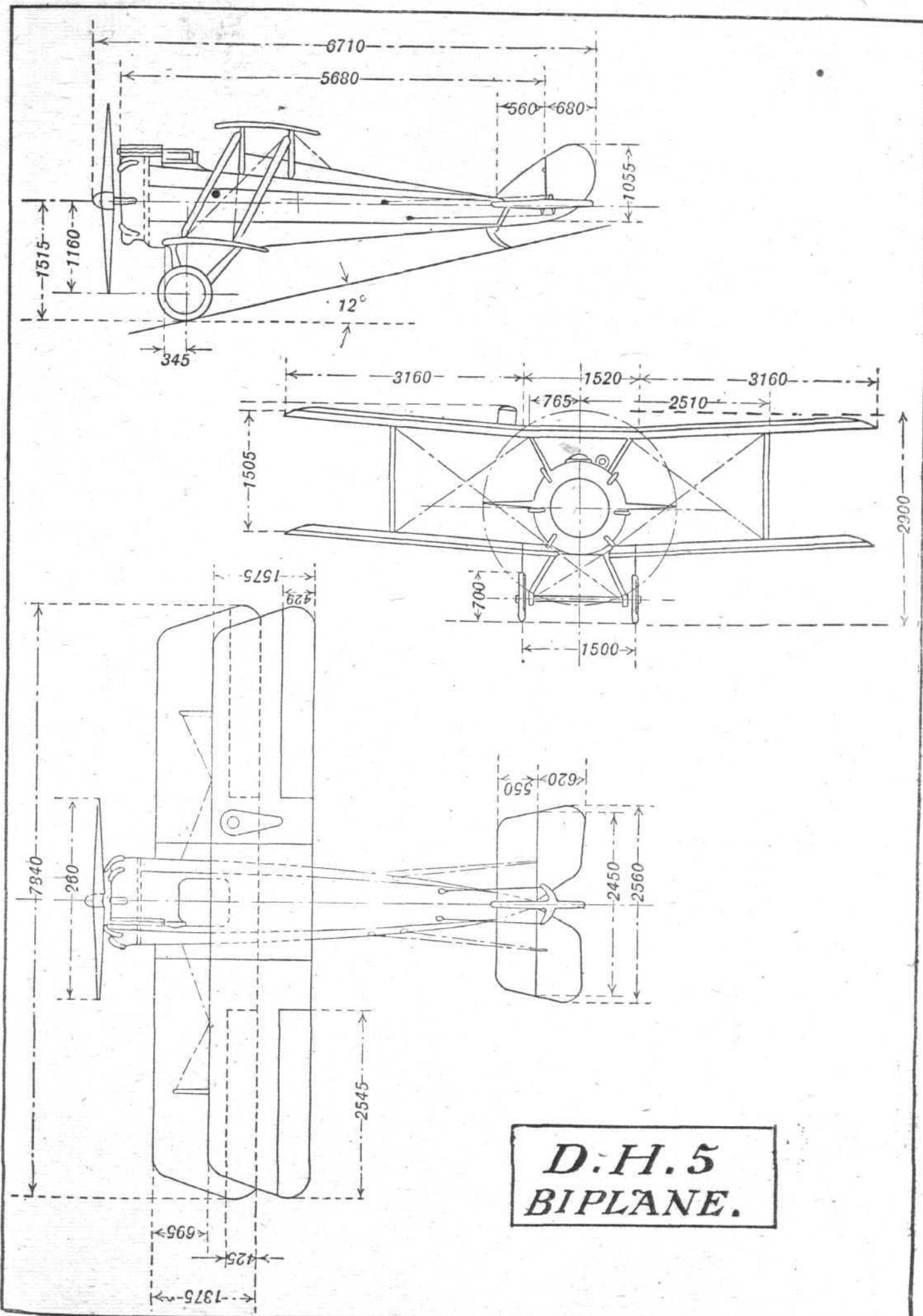
\* Translated from *Zeitschrift für Flugtechnik und Motorluftschiffahrt* by Aviation, New York.

The tail plane is of one piece, and is mounted on the body at an angle of incidence of  $1^\circ$ , without the customary incidence-change gear. The elevator is of the divided type, each portion having its own crank with single control leads.

The power plant consists of a 110 h.p. rotary Le Rhone engine, which is known to have developed 130 h.p. in earlier tests. The main fuel tank contains 100 litres of gasoline, and the oil tank has a capacity of 21 litres; both are mounted behind the pilot. There is in addition an emergency gravity fuel tank of 26 litres capacity, which is mounted on the upper starboard wing. The engine is fed from the main tank by compressed air, generated by a small air pump, which is



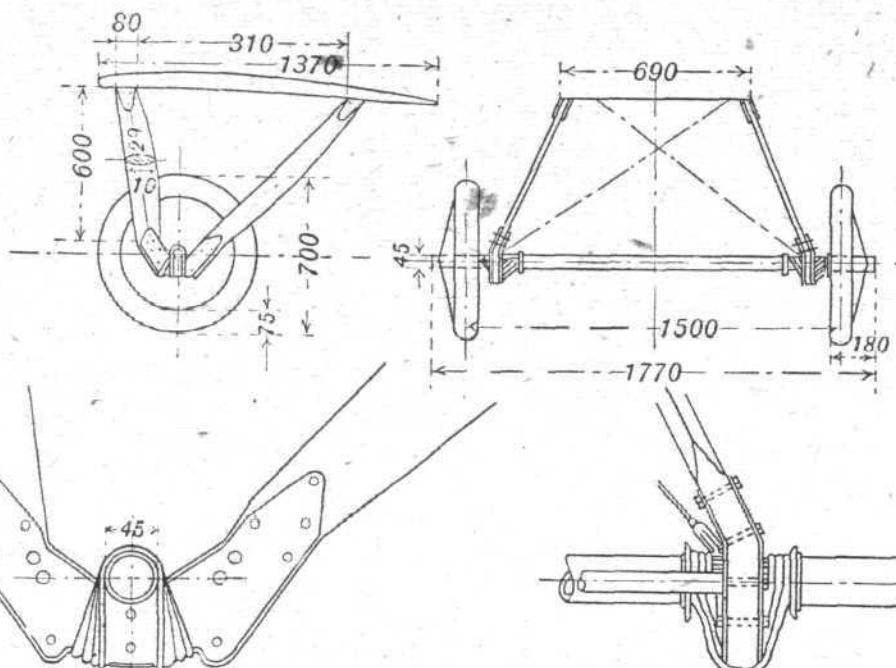
Three-quarter rear view of a D.H. biplane in Trafalgar Square.



**D.H.5  
BIPLANE.**

General arrangement of the D.H.5 biplane.

Details of the undercarriage of the D.H.5.

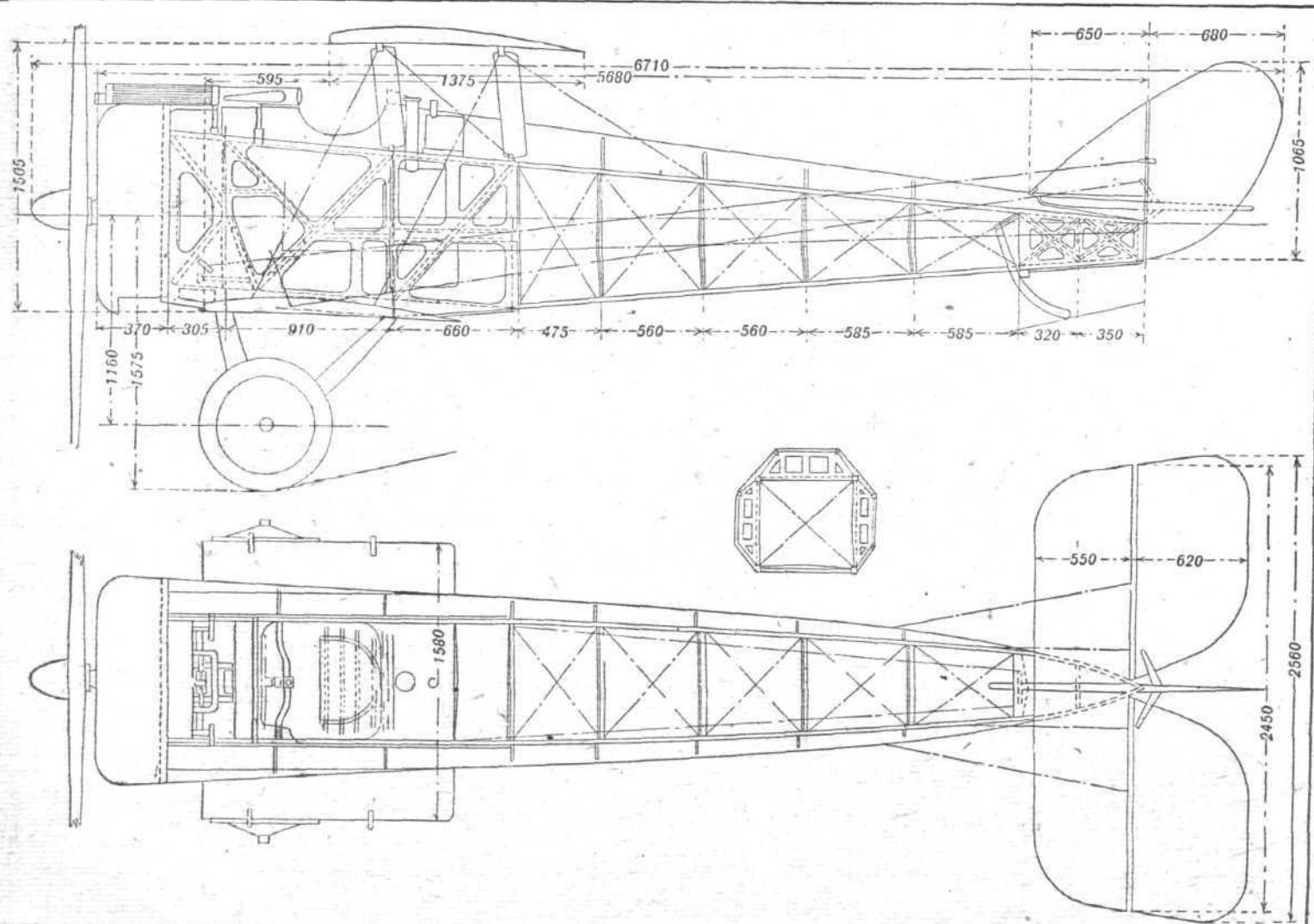


attached to the left forward undercarriage strut. The total fuel supply insures a flight endurance of about two hours.

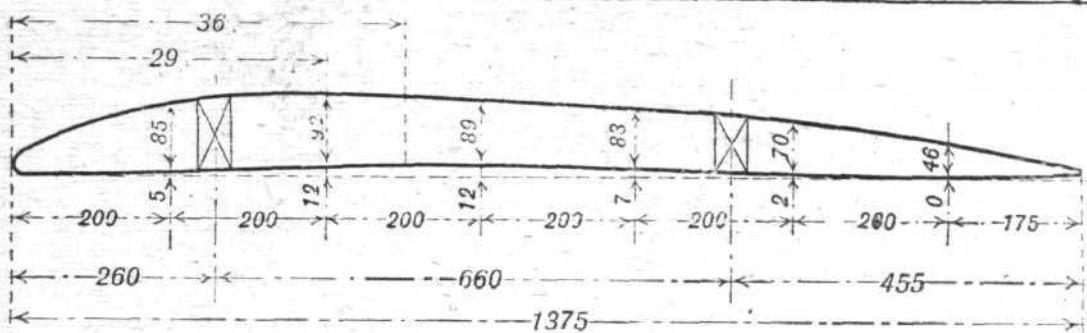
The following instruments are mounted in the pilot cockpit : To the right, two fuel supply pipes with stop cocks, and a change gear for the elevator control ; on the instrument board, tachometer, speedometer, altimeter, spark switch, watch, and compass ; to the left, fuel and oil throttles, and a hand pump for the air. Two machines of the same model, which were

built by the Aircraft Manufacturing Company, Ltd., London, have the instruments disposed in a much handier manner, and are also fitted with an electric lighting system for night-flying.

The armament of the D.H.5 consists of a Maxim machine gun, which is synchronised to fire through the airscrew and is mounted on the nose of the machine to the left of the pilot. The control is of the hydraulic type, and the release is effected



Detailed view of the body of the D.H.5 in side elevation and plan



Wing section of the D.H.5.

by means of a Bowden cable. The cartridges are carried in a metallic belt, and the box into which it runs is fitted directly below the machine gun, behind the engine.

The weight of the machine, empty, is 461 kg., and, fully loaded, is 694 kg. The wing area being 20.14 sq. m., and the horse-power being assumed 130, the wing loading appears to be 34.4 kg. per sq. m., and the power loading 5.33 kg. per horse-power.

The great visual range of this machine is noteworthy, both forwards and upwards : this feature has been achieved by the negative stagger of the wings, as well as by placing the tanks behind the pilot seat. While this arrangement does not possess any aerodynamic drawbacks for longitudinal stability, it would seem as if the increase of the angle of incidence of the upper wing toward the tips should unfavourably influence transverse stability.



## The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

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(Registered under the War Charities Act, 1916)

**Administered by the Royal Aero Club**

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**Subscriptions**

	£	s.	d.
Total subscriptions received to Oct. 15th, 1918	13,540	0	7
E. H. Humphries ..	5	5	0
The Staff and Employés of S. Sansum and Co., Eagle Tube Works, Wolverhampton (First monthly subscription) ..	4	8	7
South Western Area Recreational Training Association, Headquarters, Royal Air Force, Salisbury (Fourth donation, making a total of £522 1s. id.) ..	103	5	0
"The Lymits" Royal Air Force Concert Party, No. 8 (Lympne) A.A.P., Royal Air Force, Lympne ..	9	0	0
Total, October 22nd, 1918 ..	13,661	19	2
Offices : THE ROYAL AERO CLUB, 3, CLIFFORD STREET, LONDON, W. 1.			
H. E. PERRIN, Secretary.			

**Education at the R.A.E.**

SEVERAL hundred students have joined the technical classes at the Royal Aircraft Establishment, Farnborough. Engineering, chemistry, shorthand, and English are the favourite subjects.

**A Distinctive Badge for Rhodesians**

THE British South Africa Company recently represented to the Air Ministry that it would give great satisfaction to the men ordinarily resident in Rhodesia, of whom a considerable number are serving in the Royal Air Force, if they were allowed to wear on their uniform a distinctive badge consisting of the word "Rhodesia." The company have now been informed by the Air Ministry that approval is given for the badge to be worn with R.A.F. uniform by all ranks now serving in the Force, who were ordinarily resident in Rhodesia before joining it, and that the necessary orders will be promulgated in due course. Arrangements are being made at the office of the Air Ministry for the issue of the badges. The design will be similar to that worn by men from other Colonies.

**Kitchener Scholarships**

INCLUDED in the ten Kitchener Scholarships awarded on October 17th by the Lord Kitchener National Memorial Fund was the following :—  
C. L. Robertson, Cadet, A.S.C., attached R.A.F., scholarship for three years at Oriel College, Oxford.

The Scholarships are given to disabled officers and men

who, on the outbreak of war, relinquished their studies at universities and hospitals, in order to join the forces.

**Back from Germany**

THE following officers who were prisoners in Germany have now arrived in England :—

Rushworth, Capt. H. M., London R., attd. R.F.C.

Trollope, Capt. J. L., M.C., R.F.C.

The following soldier, who was a prisoner in Germany has now arrived in Holland for internment :—

8102, E. G. Perry, R.F.C.

**Exhibition of Enemy Aircraft**

FROM Monday next the exhibition of enemy aircraft at the Agricultural Hall, Islington, will be closed, but it is proposed to re-open it very shortly as a public exhibition. Not only will there be a large number of enemy aeroplanes on view, but also an extensive collection of engines and accessories, including wireless gear, machine guns, bomb sights, clothing and instruments. A charge will be made for admission, and this will go to swell the R.A.F. Hospitals Fund.

**Higher Prices for Irish Flax**

THE Flax Control Board has decided, in consideration of special circumstances which have arisen, and on the recommendation of the Ministry of Munitions, to make an advance on the prices previously announced for Irish flax of the 1918 crop of 5s, a stone on each grade. The Flax (Irish crop) Order, 1918, will be amended accordingly.

## THE PARACHUTE IN GERMANY

FROM the earliest days of flying, inventors have been busy thinking out appliances intended to safeguard the life of the aviator, often, be it said, prompted by an exaggerated notion of the dangers attending flight in an aeroplane. Of such appliances probably the parachute has been that appealing most to the inventive mind, possessing, it would seem, distinct merits which only needed adapting in minor details to the requirements of the aeroplane. The parachute was, of course, well known and in use long before the aeroplane, and the problem of how to apply its use for jumping from an aeroplane would not, upon first glance, appear a particularly difficult one. There was no lack of ideas, but the chief difficulty was to test these ideas under conditions approaching as closely as possible to those obtaining in the air, *i.e.*, during actual flight. This is scarcely to be wondered at, since not only would the experiment necessarily be one entailing considerable risk on the part of the parachutist—dummy figures are never conclusive—as nobody could predict with any

and still is, for that matter, slow at first, on account of the questionable advantages attending its use. Before the war an aeroplane seldom misbehaved to the extent of breaking in the air, and as long as the machine held together there really did not seem to be any function of which the parachute was capable that could not equally well, or better, be performed by the aeroplane. Then war came, and breakage in the air became no uncommon occurrence with the introduction of machine guns and "Archies." There was, further, the danger of fire breaking out on board, a danger always present where petrol is the fuel, to be sure, but a danger greatly increased in aerial fighting when tanks may easily be hit and the petrol run out on to some hot portion of the engine. All these risks appeared to bring into prominence again the question of the use of parachutes. Of what has been done at home nothing may be said, and it is, indeed, little enough in all conscience, at any rate as far as the authorities are concerned. We are here referring to the use of parachutes



THE PARACHUTE IN GERMANY.—Two photographs showing the harness by which the parachute case is strapped to the back of the aviator. Note the anchor rope passing out of the open end of the parachute case and to the observer's cockpit.

degree of certainty the behaviour of a parachute when launched from a swiftly moving aeroplane, but there was also a very great possibility that the aeroplane itself might be thrown out of control, with disastrous results. It should further be remembered that in the early days of flying the need for such an accessory as the parachute was somewhat problematic, since, if trouble occurred when the machine was at a low altitude, the parachute would in any case be useless (or so it was thought), while in case of something going wrong when the machine was at a fair height the aeroplane itself was thought to form the best parachute possible, inasmuch as it had the additional advantage that it could be guided to any desired spot within fairly wide limits. It was not until that fine sportsman, the late M. Pegoud, demonstrated it by jumping from a Blériot monoplane that the world at large realised the possibility of coming down safely from an aeroplane in a parachute. This daring experiment further showed that an aeroplane left to its own devices would not necessarily crash itself on the ground, for Pegoud's Blériot was, as a matter of fact, very little damaged after making a landing on its own accord.

Progress with the parachute as applied to an aeroplane was,

on aeroplanes, and not to the other uses to which the parachutes have been and are being put.

The chief thing to keep in mind when discussing the pros and cons of the parachute as applied to the aeroplane is that the extreme views, which are those one most frequently meets with, are not to be taken too seriously. On the one hand we have those who see no use whatever in the equipment of the crew of an aeroplane with parachutes. On the other, we have the enthusiasts who think the parachute is a remedy for all troubles besetting the path of the aviator. Neither is, of course, absolutely correct, and the truth is, as usual, to be found somewhere between the two extremes. In the first instance, let us take the case of an aeroplane having one of its wings broken. The machine will drop fairly fast, probably spinning as it falls. A parachute anchored by some means to the aeroplane would have a very small chance of opening out when the pilot jumped, since the machine would probably be falling at least as fast as the ordinary rate of descent of a parachute with a man attached. If the parachute could be flung upwards and open there, thus dragging the man clear of the machine in an upward and rearward direction rather than in a downward one, there might

be a chance of saving the aviator. With the type depending on being pulled away from the machine by the jerk of the aviator jumping out and falling a short distance there would appear to be small chance of doing so.

To take another instance, let us suppose that some of the controls have been shot away, and that, in consequence, the machine behaves in an erratic manner. Here it would appear that by awaiting a suitable moment the aviator might stand a good chance of getting away, since the machine would almost certainly at some time or other be in a more or less safe attitude, not dropping too fast. Or, some part might be supposed shot through and damaged to such an extent that its breaking would become a question of minutes or seconds only.

This, again, would appear to be a case where the parachute might be called upon to get the aviator clear of the machine before the vital part broke and the machine became uncontrollable.

it would be useful—which is not, as we have pointed out, the case—the fitting of a parachute would be decidedly desirable. That this is now realised in official quarters in Germany is evident from the number of accounts in the Press of German aviators saving themselves by jumping from their burning machines in parachutes, and, apparently, landing safely.

The accompanying illustrations, reproduced from a German paper, should therefore be of interest in showing how the Germans arrange their parachutes on the aeroplane. Unfortunately one must, for obvious reasons, refrain from criticism and comparison with our own methods of doing the same thing. As far as can be judged from the illustrations—and no descriptive matter is vouchsafed—the German parachute is contained in a bag or case. This case is, apparently, strapped to the aviator in such a position that when he is seated in the machine it, and the parachute inside it, forms a cushion for him to sit on. The rope by which the parachute is attached to the machine is fairly long, probably with a



**STRAPPING THE PARACHUTE HARNESS ON A GERMAN AVIATOR.**—In the right-hand picture the parachute in its case is lying on the coaming of the machine. During flight the case and parachute form a cushion on which the aviator sits.

Then there is the case of the aviator who has been so severely wounded that he knows it is more than probable that he will lose consciousness before he can manage to make a landing. In such a case the parachute might almost certainly be depended upon to land him far more gently, even if he be unconscious, than would an aeroplane landing without the guiding hand of a pilot. For this case, therefore, one must again acknowledge the utility of carrying a parachute.

Lastly, we come to the case of fire on board. Here, without a doubt, the parachute would be in its proper sphere, since it would give the crew time to get away from the machine before the fire reached them. With the excellent stability of the majority of modern aeroplanes, and with the devices for locking the elevators that are now so frequently fitted, the machine would carry on on a level path long enough for the crew to get away. Fire on board is one of the most dreaded dangers of the war aviator, and it would therefore certainly appear that, even if this were the only case in which

view to getting the aviator well clear of the machine before the parachute opens, and passes out of the open end of the case and into the aviator's cockpit. So far as one is able to ascertain the function of the parachute is as follows: The aviator, with the parachute in its case strapped to his back, jumps overboard. When he has reached the limit of the anchor rope the jerk pulls the parachute out of its case, which remains strapped to the man, and opens out. With such a comparatively long rope the opening of the parachute probably takes place a considerable distance below the machine, thus minimising the danger of the parachute catching in any part of the tail planes or tail skid. As to the manner in which the parachute is folded inside the case, and any means for ensuring the proper opening, no particulars are given; but as some of these parachutes are in the hands of our authorities they have had an opportunity of examining such details as these, and to discover whether or not there is anything that might be adopted for our own parachutes.



#### The Air League of the British Empire

In future the Aerial League of the British Empire will be known as the Air League of the British Empire, the change having been decided upon at a meeting on October 16th. Mr. P. S. Foster, M.P., stated that during the past year the League had secured, by dint of careful enquiries, offers of 70,000 ash trees to the Government Aircraft Production Department, and had assisted the authorities in many other ways.

#### Aircraft First in Ostend

THE first intimation that the Germans had evacuated Ostend came through French aviators, who, flying over the region on the morning of October 17th, were not fired on, then noticed the absence of German soldiers and the Belgians waving hats and handkerchiefs. One French pilot landed in the town and was carried shoulder high through the streets while the last of the garrison were making their escape towards Bruges.

# THE ROLL OF MODOR

(When an Officer is seconded from the Army, his unit is shown in brackets.)

Published October 16th.

## Killed.

Belyea, Sec. Lieut. A. F.  
Dixon, Sec. Lieut. C.  
Stanley, Sec. Lieut. C. G. (R. War.).

**Previously Missing, now reported Killed.**

Ewart, Sec. Lieut. K. P. (R.F.C.).

## Died of Wounds.

Theron, Lieut. W.  
Austin-Sparkes, Capt. J.  
Frank, Lieut. C. L.  
Lisle, Lieut. C. F. J.  
Robinson, Sec. Lieut. C. E.

Brooks, Sec. Lieut. W. J.  
Brown, Sec. Lieut. T.  
Cawley, Sec. Lieut. C. F.  
Cooke, Lieut. P. B.  
Dougan, Sec. Lieut. W. L.  
Drake, Capt. E. B.  
Einstead, Lieut. F.  
Elworthy, Lieut. L. M. (Essex).  
Gould-Taylor, Lieut. J. (Aus. F.C.).  
Heway, Sec. Lieut. H. B.

**Correction:**

Coleman, Sec. Lieut. L. should read Coleman, Lieut. L.

Published October 17th.

## Killed.

Barber, Sec. Lieut. G. S.  
Bell, Sec. Lieut. A. R.  
Brandt, Lieut. J.  
Churcher, Sec. Lieut. E. C.  
Jones, Sec. Lieut. A. T.  
Nicholls, Lieut. E. C. H. R.  
Press, Sec. Lieut. H. W.

**Previously reported Wounded, now reported Died of Wounds.**

Caton, Sec. Lieut. F.

## Wounded.

Ballantyne, Sec. Lieut. J. B.  
Banham, Sec. Lieut. E. G.  
Bennett, Lieut. A. W.  
Benton, Sec. Lieut. W. C.  
Blackwell, Sec. Lieut. S. F.  
Blasdale, Sec. Lieut. C. W.  
Crees, Sec. Lieut. H. S.  
Hickman, Sec. Lieut. B.  
Johnson, Sec. Lieut. A.  
Joseph, Capt. W. E. (R.F.A.).  
Kime, Sec. Lieut. G. H. E. (Essex).  
Kirkland, Lieut. H. G.

## Missing.

Allan, Sec. Lieut. A. M.  
Bennett, Lieut. R. C.  
Blundell, Sec. Lieut. J. B.  
Boulton, Sec. Lieut. N. S.  
Bramwell, Sec. Lieut. R.  
Bromley, Lieut. J. L. (A.S.C.).  
Campbell, Sec. Lieut. R. O.  
Case, Sec. Lieut. C. H. (Manch.).  
Clarke, Sec. Lieut. C. E. (W. Yorks.).  
Coghill, Sec. Lieut. W. H. (Sea. H.).  
Fair, Sec. Lieut. V. A. (K.R.R.C.).  
Foster, Lieut. C.  
Hazel, Lieut. D. H. (K.O. (R. Lan.)).  
Hostetter, Lieut. T. R.  
Jones, Sec. Lieut. A. S.

Published October 18th.

## Killed.

Bond, Sec. Lieut. R. H.  
Davis, Sec. Lieut. W. J.  
Hammond, Capt. J. J.

Bennett, Lieut. A. C.

Douglas, Sec. Lieut. A. A.  
Hicks, Lieut. G. R.  
Robson, Lieut. M. G., M.C.  
Skinner, Lieut. H. W.

**Previously Missing, now reported Wounded and Prisoner in German hands.**

Forrest, Lieut. L. H. (I.A.).

Boswell, Sec. Lieut. A. T. W.  
Davis, Sec. Lieut. L. S.  
Eveleigh, Sec. Lieut. E. R.  
Featherstone, Lieut. G. A.  
Firth, Lieut. J. W.  
Gundill, Sec. Lieut. R. P.  
Hopkins, Lieut. F.  
Joffe, Sec. Lieut. W., D.S.O.  
Matheson, Lieut. A. M.  
Morgan, Lieut. R. J.

Barnes, Sec. Lieut. A.  
Bell, Sec. Lieut. L. H.  
Kelly, Lieut. W. J.

## Missing.

Owen, Sec. Lieut. F.  
Pierce, Lieut. J. B.  
Preece, Sec. Lieut. E.  
Ramsay, Lieut. J. W. McN.  
Sanderson, Lieut. A. M.  
Sheehan, Sec. Lieut. M. J.  
Sherek, Lieut. P.  
Smith, Lieut. G. J.  
Smith, Sec. Lieut. T. T.

Published October 19th.

## Killed.

Sheridan, Lieut. J. W.  
Sanders, Sec. Lieut. R. F.

## The Fate of Garros

THERE was a persistent rumour in Paris last week that Lieut. Garros was slightly wounded and had been interned at Coblenz. This was hardly credited in view of the cir-

**Previously Missing, now reported Killed.**

Gould-Taylor, Lieut. J. (Aus. F.C.). Spencer, Lieut. N. I., M.M. (Aus. F.C.).

## Died of Wounds.

Arkle, Lieut. C. W.  
Hacker, J. McM.  
Morgan, A. D.

Baker, Lieut. C. G.  
Chinn, Sec. Lieut. T. E.  
Croudace, Lieut. H.  
Hannay, Capt. W. A.  
Johnson, Sec. Lieut. N. K.

Jennings, Sec. Lieut. J. E.  
Shook, Lieut. J. K.  
Telfer, Sec. Lieut. H. C.  
Thomas, Sec. Lieut. H. S.

## Wounded

Lee, Lieut. C. H.  
MacLarty, Sec. Lieut. J.  
Meddocks, Capt. H. H.  
Smallman, Lieut. B. S.  
Wallace, Lieut. W.

## Missing.

Thompson, Lieut. C. W. M.  
Weale, Sec. Lieut. F. H. A.  
Welch, Capt. H. J.

Published October 21st.

## Killed.

McMurdo, Sec. Lieut. G. B. M.  
Munroe, Sec. Lieut. J. W.  
Wayman, Sec. Lieut. R. F.

## Died of Wounds.

Attwood, Sec. Lieut. J. T. L.  
Berry, Lieut. H. H.  
Lethbridge, Sec. Lieut. T. J.  
Gordon, Sec. Lieut. R. V.

## Wounded.

Huck, Sec. Lieut. D. E.  
Jacobs, Capt. B.  
Jenkins, Sec. Lieut. J. G. T.  
Katte, Sec. Lieut. A. P.  
McClinton, Sec. Lieut. F. D.  
Martyn, Capt. T. J. C.

**Previously Missing, now reported Wounded and Prisoners.**

Dean, Sec. Lieut. H. H.

**Previously Missing believed Wounded and Prisoner, now reported Wounded and Prisoner.**

Bott Capt. A. J.

## Missing.

Bowater, Capt. A. V.  
Brumell, Lieut. H. P.  
Darby, Sec. Lieut. E.  
Gedge, Sec. Lieut. G.  
Halford, Sec. Lieut. W. H. L.  
Hollings, Sec. Lieut. H.

## Prisoner.

Bockett-Pugh, Lieut. H. C. E.

**Previously Missing, believed Prisoners, now reported Prisoners.**

Gillan, Lieut. C. J.

McLeod, Lieut. G. D.

## Previously Missing, now reported Prisoners.

Coleman, Sec. Lieut. C. B.  
Evans, Lieut. H. B.  
Gerson, Sec. Lieut. L. M.

Inman, Sec. Lieut. H.  
Le Roy, Lieut. H. L.

Published October 22nd.

## Killed.

Crombie, Lieut. W. E., M.C.  
Donald, Sec. Lieut. C.  
Gerhardi, Sec. Lieut. H.

Hinder, Sec. Lieut. A.  
Padmore, Lieut. A. R.

**Previously Missing, now reported Killed.**

Johnson, Lieut. T. A.

## Accidentally Killed.

Trotter, Lieut. C. (Alta. R.).

## Died of Wounds.

Haynes, Sec. Lieut. P. A.

**Previously Missing, now reported Died of Wounds.**

Capt. R. W. Howard, M.C. (Aus. F.C.).

## Wounded.

Ambler, Lieut. J. C.  
Barry, Lieut. H. E.  
Brown, Sec. Lieut. F. R.  
Casey, Lieut. R. F.  
Eastaugh, Lieut. W. S.

**Previously Missing, now reported Wounded and Prisoners.**

Simons, Sec. Lieut. A. T.

Sinclair, Sec. Lieut. L. R.

**Previously Missing, believed Wounded and Prisoner, now reported Wounded and Prisoner.**

McKelvey, Lieut. M. T.

**Previously Missing, believed Prisoners, now reported Prisoners.**

Patrick, Lieut. W. D.

Towne, Sec. Lieut. L. L. F.

## Missing.

Beck, Lieut. T., M.C.  
Bell, Sec. Lieut. E. M.  
Buckingham, Capt. W.  
Clark, Capt. A. B., M.C.  
Farrand, Sec. Lieut. E. S.  
Fletcher, Sec. Lieut. A.

**Previously Missing, now reported Prisoners.**

Robinson, Lieut. J. C.

Tempest, Sec. Lieut. W. C.

Rogers, Lieut. F. I.

Whitfield, Lieut. G. H. P., M.C.

**Previously Missing, now reported Prisoners in German hands.**

Cox, Lieut. G. (Aus. F.C.).

Pitman, Lieut. R. C. (Nova Scot.).



cumstances under which he was missing, and the Germans unfortunately set all doubts at rest on October 16th by announcing that he had been shot down and killed on October 4th.

# THE AUSTRIAN BERG SINGLE-SEATER

200 H.P. AUSTRO-DAIMLER ENGINE

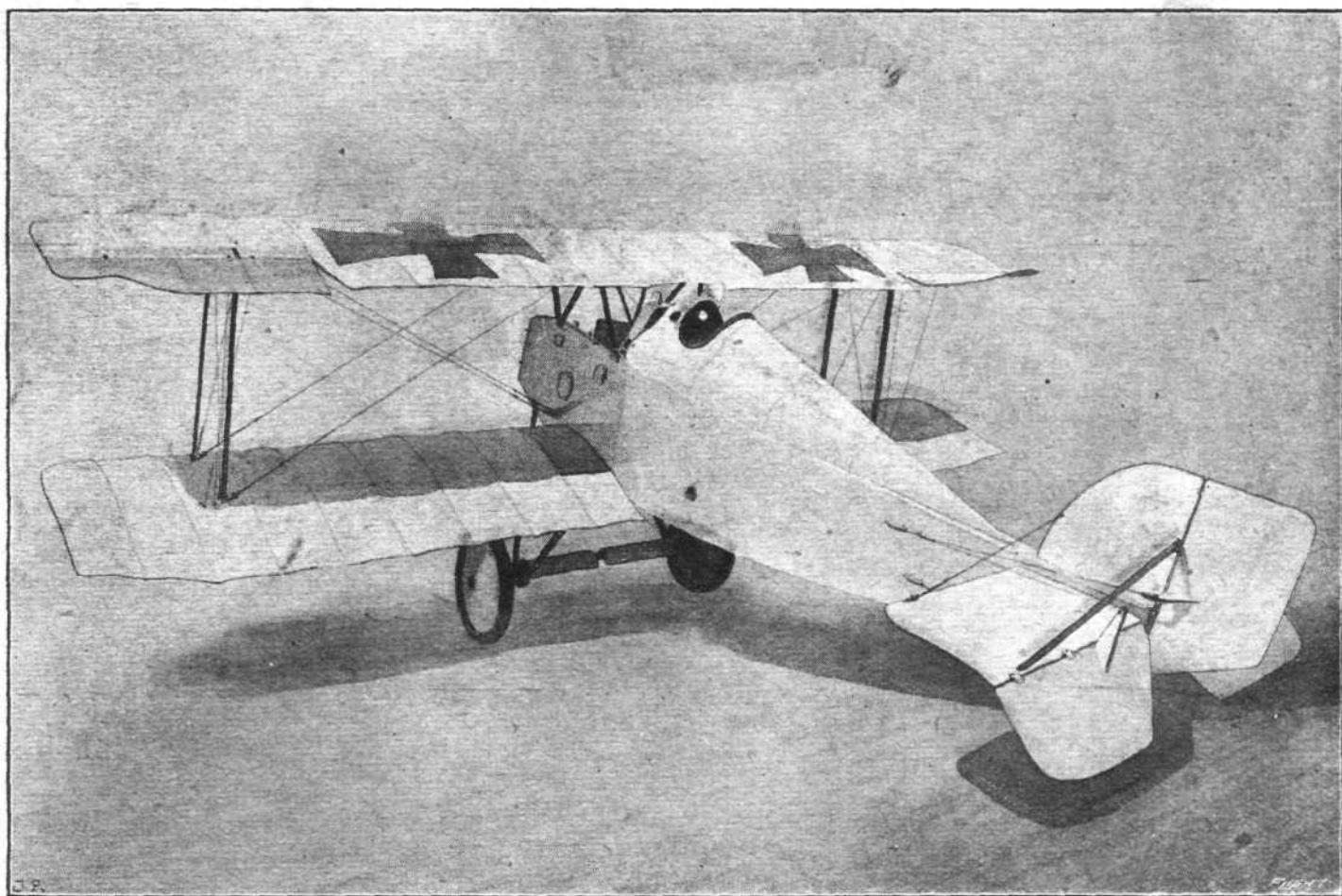
[In our issue of May 23rd, 1918, we published a brief description and an illustration of the Austrian Berg Single-Seater. We have since been able to carefully examine this machine in detail, and to prepare drawings and sketches of its main constructional features.—ED.]

As a type the Austrian Berg belongs to the single-seater fighter class with high-power engine. It follows what has now become almost standard practice for single-seaters in its strut arrangement, which comprises only one pair of inter-plane struts on each side. As a single-seater it is desirable that the view forward and upward shall be as good as possible, and this has been aimed at, and attained to quite a fair extent, in the Berg by placing the top plane low over the body, where, owing to the angle of incidence, the pilot from where he is placed sees it practically edge on. When we say that the top plane has been placed low over the body we do not mean to infer that the gap between the planes has been reduced beyond normal. Rather has the relative position of top plane and top of body been attained by making the body very deep at this point, and by so seating the pilot

turtle-back. This will be seen in the plan view of the general arrangement drawings and also in the plan of the body in Fig. 1.

#### Fuselage.

Constructionally the fuselage of the Berg biplane is of the same type as that of the earlier models of Albatros biplanes, i.e., there is a light internal framework of wood, covered on sides as well as top and bottom with three-ply. There are no internal wires for bracing the body, the three-ply covering being relied upon to perform this function. Although not possessing such refinements as rounded sides, the body of the Berg is of fairly good stream-line form, as will be seen from the illustrations. The machine exhibited is in a somewhat incomplete state as regards its front portion, especially the top covering of it and the engine-housing and radiator, which



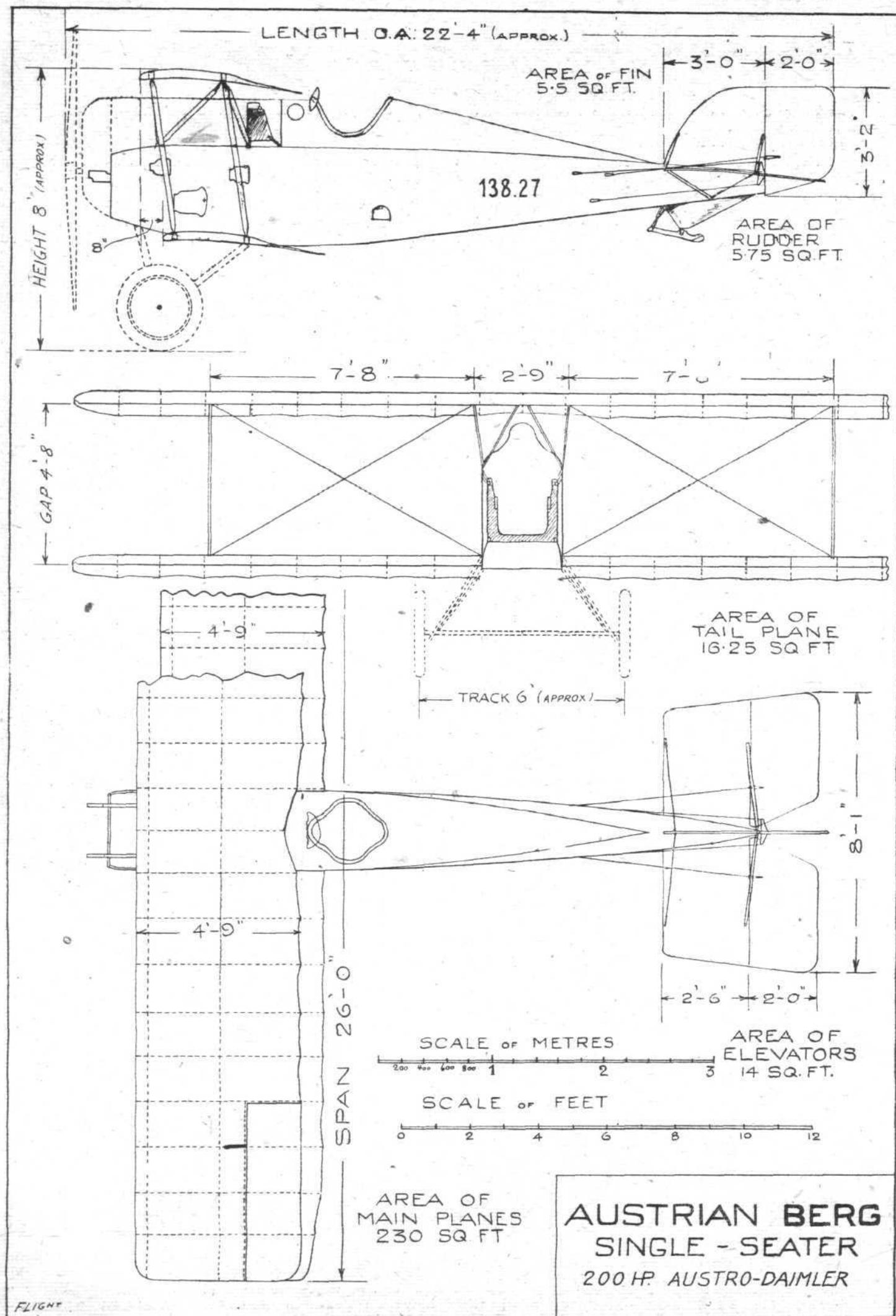
Three-quarter rear view of the Berg single-seater.

—fairly high in the body—that he obtains the view desired. This is accomplished, not so much by making the main body very deep, but by surmounting it with a fairing or turtle-back of much greater depth than those usually found on machines of this size. With the object always in view of obstructing the pilot's vision to as small extent as possible, this turtle-back, also that portion of it lying in front of the pilot, has been kept narrow at the top. In section it forms what is roughly the shape of a man's head and shoulders, as will be seen from the front elevation in the general arrangement drawings. In this manner, by leaning his head slightly to one side or other, the pilot can easily see past his engine, the cowling of which, although not in place on the machine examined, has probably conformed to the same contour as the rest of the fuselage top. To the rear of the pilot's seat this turtle-back tapers off until it ends in a point some little distance ahead of the tail planes. The lateral taper of it is somewhat more abrupt than is that of the body rails, so that as the rear portion of the body is approached there is a widening strip of flat horizontal surface on each side of the

is absent. We have endeavoured, however, to reconstruct it to a certain extent, as shown by the dotted lines in the side elevation of the general arrangement drawings. The top plane shows clearly that no radiator has been mounted in its centre section, and as there are no indications that the radiator has been fitted on the sides of the body, the inference is that it must have been placed in the extreme nose. As to the exact shape the radiator may have had, this is a matter for conjecture, but in view of the shape of the fuselage top it appears probable that the radiator was of somewhat similar shape, as otherwise undesirable lines must have developed where the shape of the radiator was carried into that of the engine-housing.

The general shape of the body, and many of the details will be clear from Fig. 1. It will be seen that there are only four main *longerons*, whereas the early-type Albatros had six, two of which were placed approximately halfway up between upper and lower corner rails. In the front portion of the body the bulkheads are of special form to provide supports for the two engine-bearers. The shape of these

OCTOBER 24, 1918.



Plan, side and front elevations, to scale, of the Berg single-seater.

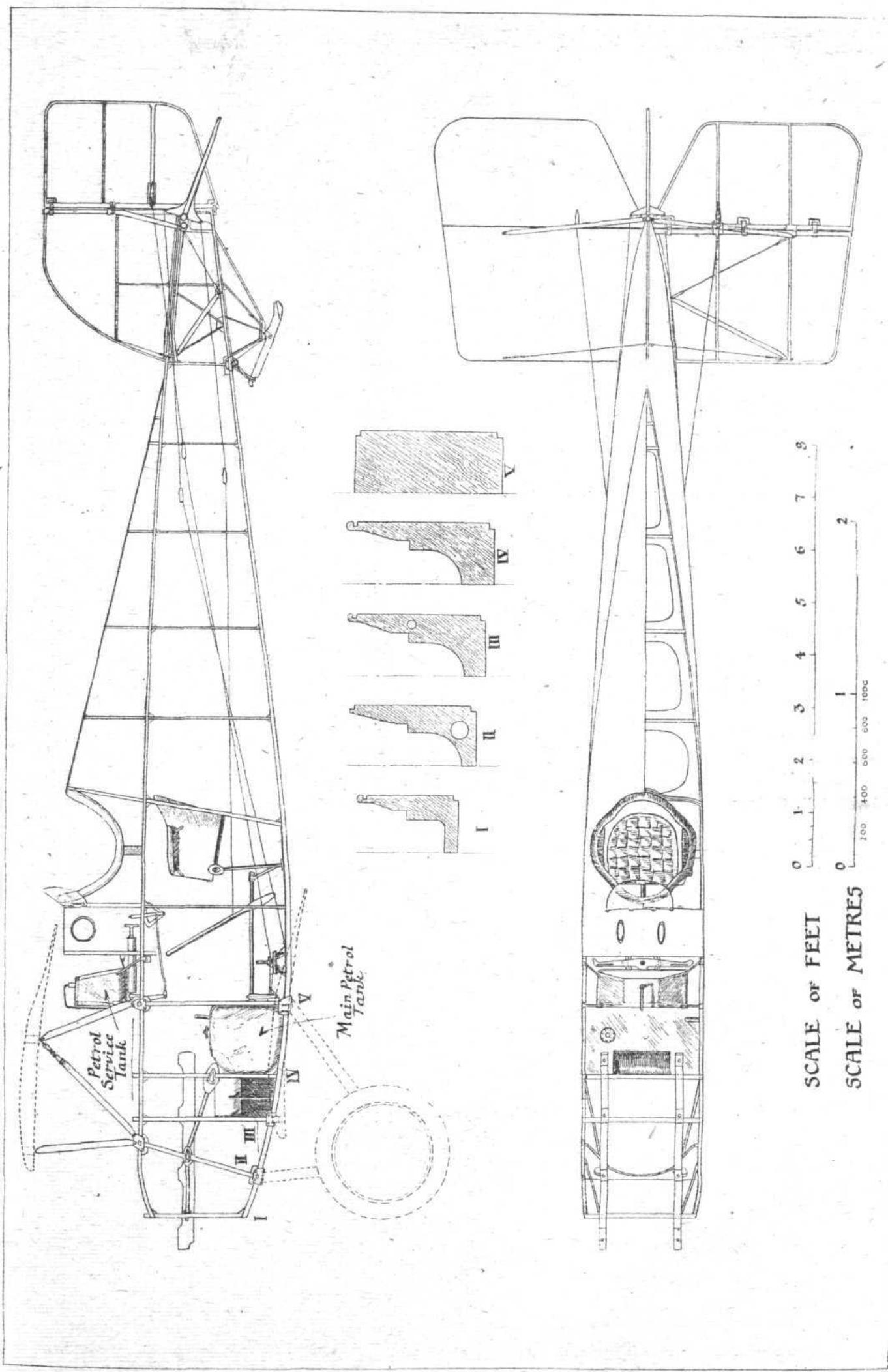


Fig. 1.—Side elevation and plan, to scale, of the body of the Berg single-seater.

bulkheads or engine cradles is shown in the half-sections I to V inset in Fig. 1. As none of these cradles had been sectioned up on the machine examined, it has not been possible to do more than give their outward shape. Judging from such external evidence, however, as rows of tacks, it appears that these cradles or bulkheads are built up of an internal framework of spruce, leaving plenty of open spaces, the whole being covered on both sides by thin layers of three-ply wood. This applies to bulkhead V as well as to the

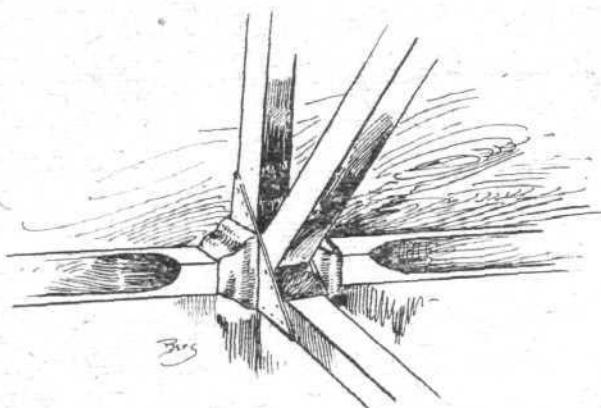


Fig. 2.—Sketch showing attachment of struts to longerons on the Berg single-seater.

others, although in the drawing it gives the impression of a solid piece of wood.

From behind the pilot's cockpit to the stern the main members of the body are of simpler form, simple frames of vertical and horizontal struts alternating with bays in which the rectangular strut frame is reinforced by diagonal struts crossing from corner to corner of the fuselage. These have not been shown in the drawing as they present no features of special interest.

The manner of joining the struts and cross-members to the main *longerons* of the Berg is of the simplest, there being no

wire bracing to provide for with consequent complexity. The struts simply rest, as shown in Fig. 2, on the *longerons*, and are secured in place by wood blocks. For the quite plain frames the wood blocks are the only supports for the struts, while where the frame is reinforced by diagonal struts—in the manner referred to above—the joint is slightly more complicated as shown in Fig. 2. Here the angles between the vertical and diagonal struts are filled with wood blocks, while a small triangle of three-ply is tacked to the sides, binding the three struts together. In the neighbourhood of the tail skid some slight variations dictated by local considerations are to be found, but the joint shown in Fig. 2 is typical of the fundamental principle.

The three-ply covering is in the form of fairly large sheets, the use of these being rendered possible by keeping the sides of the body quite flat. Adjoining sheets are butt-jointed, the joint being covered on the inside with a narrow strip of three-ply, which is riveted to the two sheets, thus holding them together. The whole appears to be done in the simplest possible manner so as to facilitate construction, yet it would appear to work quite well in practice. Altogether the impression an inspection of the Berg leaves is to the effect that everything has been designed to meet the requirements of easy production, everything being kept as simple as possible to this end. This does not mean that the workmanship is inferior. As a matter of fact, the workmanship is very good generally speaking, although the finish may be here and there of a slightly less polished order than is found in some machines. The flat top of the *fuselage* is covered underneath the turtle-back by a thin layer of three-ply wood, extensively fretted, as shown in the plan view, Fig. 1. The turtle-back itself is also of thin three-ply, mounted on light frames built up of several laminations bent to the curvature of the turtle-back at any point, and glued together. The front faces of these frames are covered with thin sheets of three-ply to prevent bending. Where it joins the flat top of the *fuselage* the turtle-back is tacked to thin strips of spruce, which are in turn tacked and glued to the flat top of the body. With this brief description of the fundamental construction of the Berg body we will leave this subject, the equipment and accessories that, although being placed in it do not form part of the main structure, being reserved for a further instalment.

(To be continued.)



## HONOURS

### M.C. for R.A.F. Officer

It was announced in a supplement to the *London Gazette* on October 15th that His Majesty the King has been pleased to approve of the award of the Military Cross to the following for gallantry and devotion to duty in the field:—

Lieut. L. H. BROWNING, R.F.A. and R.A.F.—For conspicuous gallantry and daring whilst carrying out independent bombing behind the enemy's lines. He was attacked by a fast enemy scout machine, which by skilful piloting and accurate shooting he drove down to its aerodrome. No sooner had the enemy aeroplane landed than Lieut. Browning dropped a bomb, completely obliterating the pilot, who had started to run away, and damaging his machine. He then continued bombing, and while doing so was attacked by two more enemy scouts, both of which he drove off. He showed fine skill and courage throughout.

### Gallantry in Air Raids

It was announced in a supplement to the *London Gazette* on October 19th that, the King has been pleased to approve of the award of the Military Medal to the under-mentioned ladies for distinguished services in the Field as recorded:—

Dr. PHŒBE CHAPPLE, R.A.M.C., attd. Q.M.A.A.C.—For gallantry and devotion to duty during an enemy air raid. While the raid was in progress Dr. Chapple attended to the needs of the wounded regardless of her own safety.

Asst. Adminr. ELIZABETH SOPHY CROSS, Q.M.A.A.C.—For gallantry and devotion to duty during an enemy air raid. Whilst in charge of a camp a bomb fell, killing several women and wounding others. She was knocked down, but immediately got up and, after obtaining assistance, worked with the doctor amongst the killed and wounded while the raid was still in progress.

18659 Forewoman Clerk ETHEL GRACE CARTLEDGE, Q.M.A.A.C.—For gallantry and devotion to duty during an enemy air raid. She was of the greatest assistance in keeping

the workers steady. Although both her shoes were blown off during the explosion, Forewoman Cartledge continued to carry out her duties after being wounded in the foot by some fallen wreckage.

Sister JANE ELIZABETH TROTTER, Q.A.I.M.N.S. (R.).—For gallantry and devotion to duty during an enemy air raid, which lasted from 11 p.m. till 3 a.m. Sister Trotter was in charge on night duty. During the raid she visited all the wards, reassuring the sick and wounded: her orderly being mortally wounded whilst standing by her in one of the wards. Her conduct during the whole of the raid was most praiseworthy.

Sister ETHEL FRANCES WATKINS, Q.A.I.M.N.S. (R.).—For gallantry and devotion to duty during an enemy air raid, which lasted for four hours. Sister Watkins behaved with the utmost coolness. When wounded by a piece of shrapnel she made light of her injury, and set a magnificent example to those who were with her.

Staff Nurse AGNES JACK PARKER, T.F.N.S.—For gallantry and devotion to duty under trying conditions when heavily bombed by hostile aircraft at night. The ward in which Staff Nurse Parker was on duty was badly damaged early in the raid by a bomb falling close to it. By her exceptional coolness and complete disregard for her own safety she set a splendid example to all, and gave great confidence and comfort to the patients.

Miss MARY STUBBS, F.A.N.Y.—For gallantry and devotion to duty during an enemy air raid. Miss Stubbs was detailed to evacuate a hospital. While her car was waiting to be loaded a bomb dropped within 30 yards. The stretcher-bearers, who had been loading a car immediately in front, ran for protection to dug-outs, calling to Miss Stubbs to do the same. She, however, regardless of her own safety, stayed in the open with two wounded and helpless patients to help and reassure them. She finally got them unloaded and to a place of safety. During the unloading a second bomb fell on the hospital.

## AIRISMS FROM THE FOUR WINDS.

A LITTLE while back we had occasion to record a case of prompt attention to Conchies in the U.S.A. That our Allies' methods have not been particularly modified since then emerges in an answer given last week by Mr. Macpherson to Mr. Edmund Harvey, who had asked for details of the latest administrative measures taken by President Wilson to deal with conscientious objectors to military service in the United States, and in particular, with those known as Absolutists, for whom no exemption is provided by the American Military Service Act.

THE latest information, I have, said Mr. Macpherson, is to the effect that 40 conscientious objectors were recently tried in the United States of America and sentenced to penal servitude for life, such sentence having been subsequently commuted by the military authorities to 25 years' penal servitude.

WHY should not our Bolsheviks be treated in the same way—or even some more?

THE National War Museum is getting along—if slowly. For the moment arrangements have been made for the temporary housing of the Museum in the buildings of the Royal Institute of British Architects in Conduit Street and Maddox Street. This arrangement will not interfere with the occupation of the premises by the institute, the Maddox Galleries being allotted for the purposes of the Museum. The Museum will remain at the Institute until a permanent home has been built.

It doesn't look as if there would be over much room for the accumulation of aviation exhibits, else would there be but little space left for anything else.

MANY months ago the single-command for aircraft resources was advocated in "FLIGHT" as tending to ensure with even

greater certainty the retention for the Allies of air supremacy. A good step forward in this direction is now announced from New York, in the conclusion of an agreement, after a series of conferences between Mr. Ryan (head of the United States Army Aircraft Division), and the British and French Air Ministers and Directors of Munitions regarding greater co-operation in the handling of the Allied aircraft resources.

In the future each country will be able to produce its maximum capacity along the lines in which it is best equipped, and the fighting forces of all three Air Services will be supplied from this production. The air supremacy of the Allies is not questioned, but this plan is expected to render impossible the concentration by Germany of its centralised air fleet against any particular part of the Allied line.

AT first blush, the recurrence, after many years of immunity, of hydrophobia in this country would not appear to have much connection with aviation. But Sir William Bull had something to say upon this point in the House last Monday, whereby it was alleged the culprit introducing this horrible scourge was a British officer who flew over from France with a lady's pet. Sir William might well ask, if the indictment was true, what punishment was to be meted out to this officer for thus circumventing the law. Nothing but the severest penalty should result, if only by way of a warning for all time to flying men to honourably uphold the quickly won traditions of the R.A.F. by a wholesome respect for the traditions of the British land and sea forces in observing all enactments for the common weal, however easily *via* the air it may be possible to dodge them. The most charitable excuse for such a lapse must be looked for in the ignorance of youth as to the consequences.

So after all the premises of the Society of Arts are not to be requisitioned for the Air Ministry, but only, according to Sir Alfred Mond, certain premises in Adam Street, Adelphi,



R.A.F. photograph from above, showing destruction caused by German bombing raid on a clearly marked and well-known British Hospital in France.

Air Ministry Official.

for office purposes. Moreover, according to the same authority, any decorations of historical interest and value are always respected in the necessary conversion of any buildings commandeered by his Department. (Ahem!) The question then arises, Who determines as to the historical value of any item? We have heard of some curious decisions in this connection.

ANYTHING associated with Bolshevism has acquired a well-deserved putrid reputation. Now, one of these bright apostles of ultra-villainy—to wit, Stojanow, the Chief Commissary of the Bolshevik Army—is out earning the aeroplane a bad name by getting away with by means of an aeroplane ten millions of roubles which he had stolen.

A CHANCE will occur early next month for the many who have written us in the past clamouring for information and facilities for visiting the Exhibition of Enemy Aircraft at the Agricultural Hall, Islington, to gratify their wish. This unique exhibition will be thrown open in November to the public, and it will be possible for them then to inspect the whole of the machines which have already been described and illustrated in "FLIGHT," together with very many other highly interesting and instructive exhibits, including an array of engines and accessories. With the double object of preventing too much of a crowd and providing further funds for the R.A.F. hospitals, a small charge for admission will be made.

REPORTS of experts from Switzerland of the doings and intentions of the gang responsible for Zeppelin construction, have come to be strongly suspect. Therefore it would be as well not to relax our watchful efforts this side because of the information given in a contemporary last week by a mechanic who has been employed in the Friedrichshafen Zeppelin works for the last ten months, and has just arrived at Geneva, to the effect that half the workmen in the factory have recently been dismissed, and that the remainder are employed solely on the construction of aeroplanes of various types. Zeppelins as a war weapon are, he states, regarded as dead, and they are stigmatised as an expensive "military toy." Not a single new Zeppelin has been completed during the past seven months on Lake Constance.

The mechanic also states that the 51 Zeppelins destroyed since 1914 in England and France in various raids cost £16,750,000, apart altogether from the compensation which

has had to be paid to the families of the lost crews. The remaining Zeppelins are being used merely for observation work.

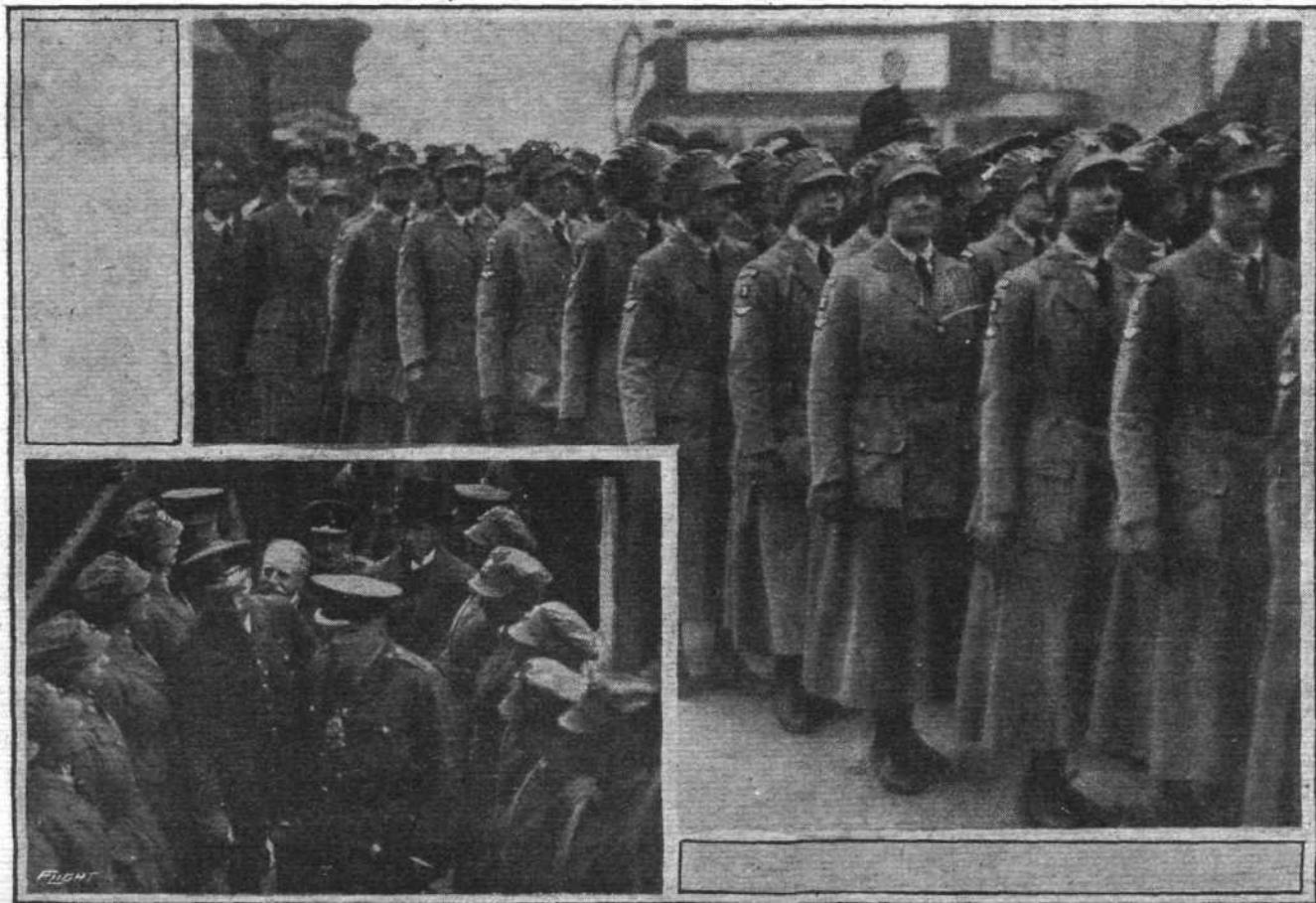
AND so at last we get definite word that Roland Garros—"l'oiseau fait homme," as a French writer has called him—will fight no more.

It was he who, in the early days of the war, brought to perfection that invention which did more, perhaps, than anything else to revolutionise the fifth arm of warfare, the synchronised machine-gun firing through the propeller. Up till that time the pilot who wished to accept combat had perforce to take with him an observer. As early as 1915 he went out on his little single-seater Morane-Saulnier, and bombarded the shipbuilding works at Bruges. As was his custom, he came down to within 100 yards of the ground to make sure of his aim, and on the return journey he encountered a Boche on whom to try his new machine-gun system. Garros was able to pick a position above and behind the German, and riddled him from a distance of about twelve yards. The enemy machine fell in flames, and the Frenchman afterwards described the unpleasant feeling he had, when he watched the sudden and violent shrug of the observer's shoulders when he was hit, which he characterised as "particularly lugubrious."

For some time Garros continued his "destructions glorious," until he disappeared. Now we learn that he was shot down and killed on the German side of the lines on October 4th.

THE following interesting description of a first trip on a glider, which will appeal with especial force to those who have essayed these precarious creatures in the early days, is taken from Mr. H. G. Wells' neglected, but delightful novel, "Tono-Bungay":—

"I had begun with a glider that I imagined was on the lines of the Wright Brothers' aeroplane, but I could not be sure. It might turn over. I might upset it. It might burrow its nose at the end, and smash itself and me. The conditions of the flight necessitated alert attention; it wasn't a thing to be done by jumping off and shutting one's eyes or getting angry or drunk to do it. One had to use one's weight to balance. And when at last I did it it was horrible—for ten seconds. For ten seconds or so, as I swept down the air flattened on my infernal framework and with the wind in my



W.R.A.F.'S MARCHING INTO THE MANSION HOUSE LAST FRIDAY.—Inset, the Lord Mayor inspects the Guard of Honour of W.R.A.F. girls on the steps of the Mansion House.

eyes, the rush of the ground beneath me filled me with sick and helpless terror ; I felt as though some violent oscillatory current was throbbing in brain and backbone, and I groaned aloud. . . . My sensations of terror swooped to a climax.

"And then, you know, they ended !

"Suddenly my terror was over and done with. I was soaring through the air right way up, steadily, and no mischance had happened. I felt intensely alive, and my nerves were strung like a bow. I shifted a limb, swerved and shouted between fear and triumph as I recovered from the swerve and heeled the other way and steadied myself.

"I thought I was going to hit a rook that was flying athwart me—it was queer with what projectile silence that jumped upon me out of nothingness, and I yelled helplessly, "Get out of the way." The bird doubled itself up like a partly inverted V, flapped, went up to the right abruptly and vanished from my circle of interest. Then I saw the shadow of my aeroplane keeping a fixed distance before me and very steady, and the turf as it seemed streaming out behind it. The turf!—it wasn't after all streaming so impossibly fast.

"When I came gliding down to the safe spread of level green that I had chosen, I was as cool and ready as a city clerk who drops off an omnibus in motion, and I had learnt much more than soaring. I tilted up her nose at the right moment, levelled again, and grounded like a snowflake on a windless day. I lay flat for an instant, and then knelt up and got on my feet atremble, but very satisfied with myself."

AN amusing incident which occurred recently at a London aerodrome exemplified the readiness of the modern woman to dabble in technical details which only a few years ago would have been outside her province, but at the same time revealed the innate capacity of the sex for drawing erroneous conclusions. A dear lady was given her first ride in an aeroplane, and busied herself throughout the flight in watching the indicators of the various instruments which recorded the progress of the machine and the behaviour of the engine. When she at length alighted from the machine she was brimful of data, which she proceeded to impart to an admiring group of mere spectators. "We attained an altitude," she said, "of 4,000 ft. and a speed of 80 miles an hour; but what astonished me very much was that at 2,000 ft. the temperature was 60 degrees, and at 4,000 ft. it rose to 85. Why was

that? I cannot understand it at all!" Neither could her wondering auditors, until she happened to come across someone concerned with the production of the machine. Controlling his features, with some difficulty, into an expression of due gravity, he informed her that the thermometer which she had been studying had nothing to do with the temperature of the outer atmosphere, but served to indicate the variations of heat in the oil within the engine! The lady, as it happened, was a journalist, and, if she had not been luckily enlightened by the expert before committing her experiences to print, Heaven only knows what weird and wonderful theory she would have expounded to a startled world as to the thermostatic properties of the upper air. It would have been open to her, at all events, to suggest that if, by rising from 2,000 to 4,000 ft. a pilot could experience an increase of 25 degrees of heat, it would only be necessary to go on climbing to enjoy the luxury of a Turkish bath!

It might be as well, having regard to the peace-wangling tactics of the Huns just now, to bear in mind that Herr Erzberger, who has been grafted on to the spoof "Democratic" German Government, was the great kultured humanitarian who one time early in 1915 gave vent to his views in the *Tag* to the effect that "the greatest ruthlessness in war presents itself, in reasonable application, as the greatest humanity. If one is in a position by some means to destroy the whole of London, that is more humane than to allow one fellow-countryman to bleed to death on the battlefield, because such a radical cure leads most speedily to peace. . . . England has stolen from us more than 400 merchant ships. The answer to this should be that for every German merchant ship one English town or one English village will be destroyed by our airmen."

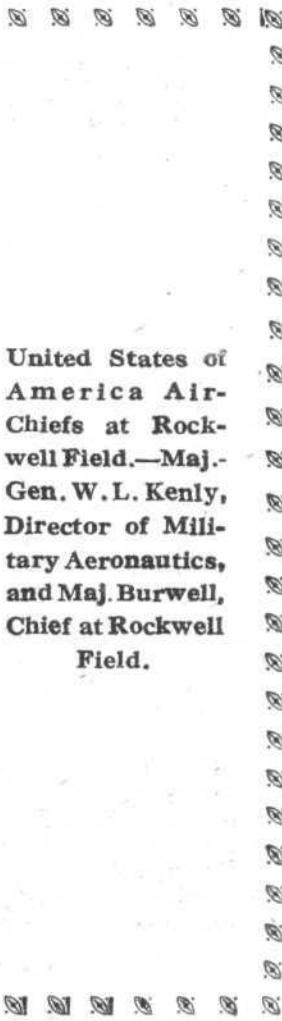
*Autre temps, autre mœurs.* Herr Erzberger is more inclined now to assume the gentleness of the sucking dove.

#### TEN YEARS AGO

*Excerpts from "FLIGHT" of 1908*

#### THE FIRST ENGLISHMEN TO FLY.

An incident of extraordinary interest and historic importance took place at Auvours on Thursday, October 8th,



United States of America Air-Chiefs at Rockwell Field.—Maj.-Gen. W. L. Kenly, Director of Military Aeronautics, and Maj. Burwell, Chief at Rockwell Field.



when Mr. Wilbur Wright took as passengers on his aeroplane four Englishmen in succession. They are the first residents of the United Kingdom who can claim to have flown and returned to the same starting point, and, as it was only appropriate, the veteran aeronaut, Mr. Frank Hedges Butler, had the record duration, with a flight of 4 mins. 31 $\frac{1}{2}$  secs. The Hon. C. S. Rolls, from whom we have received a most interesting account of his experience, which appears elsewhere, made a flight lasting 4 mins. 27 $\frac{1}{2}$  secs., while Major Baden-Powell and Mr. Griffith Brewer were aloft for 4 mins. 25 secs., and 4 mins. 22 $\frac{1}{2}$  secs. respectively.

#### SARTE HIGH-JUMP PRIZE

The rules and regulations of the High-Jump Prize instituted by the Sarthe Aero Club—principally with the idea of having

a competition of this character open to Mr. Wilbur Wright—have now been published. The prize itself is a sum of 1,000 francs, and the altitude to be attained is 30 metres. The obstacle to be cleared will consist of a row of captive balloons placed 5 metres apart, and the aviator must make a free flight lasting at least 3 mins. before executing the "jump."

#### ENTRIES FOR THE CROSS-CHANNEL PRIZE

The first entry for the *Daily Mail* Cross-Channel Prize was received on Thursday, October 8th, at the Paris office of that journal, from Messrs. Voisin, on behalf of Prince Sergius Bolotoff, who will use a three-decked machine fitted with a 100 h.p. motor. Messrs. Voisin have also sent in another entry, thus making a total number of four entries.



## QUESTIONS IN PARLIAMENT

#### The Use of Petrol in the Services

MR. JOYNTON-HICKS, in the House of Commons on October 17th, asked the Secretary of State for the Colonies whether he is satisfied that every possible economy is now being effected in the Navy, the Army, and the Air Force in regard to the use of petrol; and, if not, what further steps he proposes to take for that purpose?

Mr. Hewins: Suggestions have been made to the Departments mentioned as to various directions in which economies may be effected, and good results have been obtained. Proposals for more effective control, by which it is hoped to secure further economies, are under consideration. The hon. member may rest assured that everything possible will be done consistent with the maintenance of Naval, Military and Aerial efficiency.

#### The Air Ministry and the Adelphi

CAPT. CARR-GOMM asked the First Commissioner of Works whether any, and, if so, what, steps have been taken towards the commandeering of the Adelphi estate for the purposes of the Air Board; whether he is aware of the dissatisfaction felt at the threatened loss of this property, which is full of priceless relics of the work of the Adam Brothers; and whether, in view of this, the Committee can make a fuller inquiry into the matter?

The First Commissioner of Works (Sir Alfred Mond): There is no intention, and never has been, to commandeer the Adelphi estate for the purposes of the Air Board or any other purpose. Certain premises forming part of the Adelphi estate, and situated in Adam Street, have been requisitioned for the purposes of additional office accommodation urgently required for the Air Ministry. Dissatisfaction is always felt at any proposal to requisition, but the needs of the fighting Departments of the nation must be the first consideration of the Committee. The property in question contains very little work by the Adam Brothers, and any such work will be adequately protected, as in the case of all decorations in requisitioned buildings. The Committee caused the fullest inquiries to be made before arriving at a decision on this matter, and it is not proposed to re-open the question.

COL. YATE: Does the part commandeered include the premises of the Society of Arts?

SIR A. MOND: No; it does not.

#### The British Cellulose Company Inquiry

SIR WILLIAM BULL asked the Chancellor of the Exchequer when the Committee set up at the request of the British Cellulose Co. for the purpose of reporting on the entire position of that company and the allegations made against them is going to meet, as the company were under the impression that the Committee would have met at the time, otherwise they would have taken other steps to answer the utterly unfounded allegations made against the Ministry of Munitions and themselves?

Mr. Bonar Law: The Committee is about to hear witnesses in connection with the inquiry, but it has been necessary in the first instance to investigate the documentary material relating to the subject.

MR. G. LAMBERT, on October 22nd, asked the Prime Minister when the Report with regard to the British Cellulose Company will be presented to Parliament; and whether directors and officials of the company are serving the Government in any capacity?

Mr. Bonar Law: The Committee anticipate a complicated and prolonged enquiry, and I am not in a position to state when their Report will be completed. As far as I have been able to ascertain, the answer to the second part of the question is in the negative.

Colonel Ashley: Will counsel be allowed to appear on behalf of the interested parties?

Mr. Bonar Law: I have not asked about counsel; that must be a matter to be regulated by the preceding circumstances.

Colonel Ashley: Will witnesses be allowed to appear and to give evidence?

Mr. Bonar Law: As I have already said the form of procedure will largely depend upon the discretion of the Chairman of the Committee, and the other members.

#### Transfers from R.N.A.S. to R.A.F.

MR. SNOWDEN, on October 17th, asked the Secretary to the Admiralty if he is aware that there is dissatisfaction at the Royal Naval Barracks at Chatham among a number of men formerly attached to the Royal Naval Air Force because their right under the Air Force Constitution Act to have their attachment to the Royal Naval Air Force annulled in order to be given the option of entering the Royal Navy or of being discharged from the Service is not conceded; and will he see that the men are given the right to be discharged from the Service in



#### The British Cellulose Co.

In the Parliamentary notes above some particulars are given regarding the Committee appointed to enquire into the formation and financial arrangements of the British Cellulose and Chemical Manufacturing Company, Ltd., and associated companies, and their relations with Government Departments.

Information on matters falling within the terms of reference is invited from the public. Persons wishing to give this are asked to furnish to the Committee in writing their names and addresses, a short description of the nature of the information proposed to be given, and the name and

order that they may come under the Military Service Act with the rights of appeal for exemption which that Act confers?

DR. MACNAMARA: The question seems to indicate some confusion between the Royal Air Force and the Royal Naval Air Service. Under the Air Force Constitution Act 1917, men belonging to the Royal Naval Air Service at the date to be fixed by Order in Council could be transferred or attached to the Air Force without their consent, but if any such men gave notice within a specified time that he did not desire to be so transferred or attached, the transfer or attachment was annulled. The men referred to in the question are presumably men of the Royal Naval Air Service whose transfer or attachment to the Royal Air Force has been annulled. This process does not, however, give them any right to release from their previous naval engagements, and where they can be usefully employed under the Admiralty they are being retained.

MR. T. WILSON asked the Under-Secretary of State to the Air Ministry if he is aware that when the Royal Naval Air Service was transferred to the Royal Air Force a number of second-class air mechanics were reduced to third-class air mechanics, and that these men were promised when they were transferred that they would not be reduced; and whether he will inquire into this matter and restore the men to the rank they held when in the Royal Naval Air Service?

MAJ. BAIRD: The Air Force gradings of air mechanic, first, second, and third-class, respectively, correspond to the previous Naval Air Service gradings of air mechanic first class, acting air mechanic first class, and air mechanic second class. No loss of pay or relative rank was involved by the new nomenclature, and there has been no breach of undertaking in regard to the conditions of transfer.

#### Discharge Delay

MR. G. TERRELL asked the Under-Secretary of State to the Air Ministry if he can state the reason for the delay in discharging from the Army Third-Air-Mechanic Pte. F. J. TANNER, Royal Air Force, in order that he may be able to return to civil employment; whether he is aware that this man was by mistake enrolled in the Army; and whether, in this and other similar mistakes, a delay of three months is necessary before a release can be obtained?

Maj. Baird: The case of Pte. Tanner was first brought to the notice of the Air Ministry on September 9th. I regret the delay that has occurred in the arrangements for his discharge. Telegraphic instructions were issued yesterday that he should be released forthwith.

#### Parachutes

SIR WILLIAM BULL, on October 21st, asked the Under-Secretary of State to the Air Ministry whether any report has been received as to the use of parachutes by German airmen as a means of escape from injured aeroplanes; and whether the tenor of the report, if any, indicates that the appliance is effective in life saving?

Maj. Baird: The reply to both parts of this question is in the affirmative.

#### Probationary W.R.A.F. Officers (Eltham)

SIR W. PEACE asked the Under-Secretary of State to the Air Ministry if he is aware of the dissatisfaction on the part of the probationary officers, Women's Royal Air Force, at the conduct of the course at Roper Hall, Eltham, beginning August 27th and ending September 11th; and if he will give the numbers, respectively, of acceptances and rejections out of 175 probationary officers attending this course?

Maj. Baird: The answer to the first part of the question is in the affirmative. The number of candidates attending the probationary course for officers of the Women's Royal Air Force between the dates mentioned was 170. Of these, 51 were accepted, 112 were rejected, and seven withdrew at their own request. I am informed that all the rejected candidates who have asked for reconsideration of their cases have since been given the opportunity of appearing before an independent selection board, and that as a result 11 have been interviewed, of whom four have been accepted and seven rejected.

#### Flying over Towns

MR. MARRIOTT, on October 22nd, asked the Under-Secretary of State to the Air Ministry whether his attention has been called to the number of fatal accidents which have recently occurred in the Royal Air Force at Oxford; and whether, in view of the danger to the civil population likely to arise from such accidents, he will give orders that the instructional flights shall be directed over the open country and not over the city?

Major Baird: There have been three fatal flying accidents at Oxford in the past three months. Ordinary flying instruction is given over the meadows, and strict orders prevail against low flying over the city.



address of any person or persons who will give evidence thereon, specifying the points on which each witness will give evidence. All communications should be addressed to the Secretary, British Cellulose Inquiry Committee, Committee Room No. 4, House of Lords, S.W. 1.

#### Up-to-Date Sheffield

THE SHEFFIELD CHAMBER OF COMMERCE have no doubts as to the future of aviation, and realising the possibility of aeroplane transport after the war are urging the Development Committee of the City Council to immediately consider the question of arranging a suitable aerodrome for machines engaged in such traffic in the neighbourhood of the city.

## L'OISEAU NAGEUR (THE SWIMMING BIRD)

By M. JACQUES MORTANE

"Don't you worry," Nungesser said to me the day before. "I'll do all I can to worry through the swimming race across Paris, but I sadly fear that there won't be enough bridges for me to rest against!"

For Lieutenant Nungesser, the ace with 45 Boches officially credited to him, the survivor of 17 wounds, Officer of the Legion of Honour, Military Medal, and 22 times cited in the Order of the Day, is also the complete athlete. Champion of the lasso, automobile champion, champion runner and weight-lifter—a speedy swimmer, but really it would be quicker to tell you what he does *not* excel at! And this race through Paris was no picnic, over a course of a round dozen kilometres.

"I don't know why I should not try my luck," said he. "They have so often chucked me out for a cripple on account of my three worst wounds, and I have so often insinuated myself past them again, it would seem to follow that if I can fly I should also be able to swim. If I manage to stay the course, at least it will be an encouragement to those young fellows who, having been wounded, think they are finished for sport. What I am doing is really a kind of sportive propaganda. One thing you must not tell, and that is my method of training. Some of my comrades, serious citizens who pretend that to bring down the Boche you must affect



### Sir Douglas Haig's Praise of the R.A.F.

In his despatch, dated July 20th, 1918, detailing the events during the first four months of this year, including the retreat in March, Field-Marshal Sir Douglas Haig, K.T., G.C.B., G.C.V.O., pays the following tribute to the work of the R.A.F.:

"The work of the Royal Air Force, under command of Major-Gen. J. M. Salmond, C.M.G., D.S.O., in co-operation with the other arms, has been brilliant. Throughout the period of active operations our airmen have established and maintained a superiority over the enemy's air forces without a parallel since the days of the first Somme battle. Not content with destroying the enemy in the air, they have vigorously attacked his infantry, guns, and transport with bombs and machine-gun fire, and in fighting south of the Somme in particular gave invaluable assistance to the infantry by these means on numerous occasions. In addition, the usual work of reconnaissance, photography, artillery co-operation, and bombing has been carried out vigorously and with remarkable results."

### The R.A.F. in Italy

In his despatch dated September 14th, and dealing with the operations in Italy from March 10th, General the Earl of Cavan praises the work of the R.A.F. in the following terms:

"The work of the Royal Air Force under Col. P. B. Joubert, D.S.O., has been consistently brilliant, and the results obtained have, I believe, in proportion to the strength employed, exceeded those obtained in any other theatre of war. Between March 10th and the present date 294 enemy aeroplanes and nine hostile balloons have been destroyed, and this with a loss of twenty-four machines. Much useful work in co-operation with the artillery has been carried out, and frequent and successful long-distance reconnaissances accomplished. The action of the artillery, both British and the Italian which had been temporarily placed under my command, deserves special mention. Constant and effective counter-battery work has been carried out. The damage done has been fully confirmed both by visual observation, photography, and prisoners' statements."

### Outflanking from the Air

To what extent the R.A.F. and the Australian F.C. aided the advance of General Allenby's Army in Palestine is shown by a report which has been published in *The Times*. It says that to prevent the enemy from gaining knowledge of the cavalry movements, big bombing machines remained throughout the night of September 18th-19th over the principal Turkish aerodrome at Jenin, which was subjected to a constant rain of heavy bombs.

The methods brought to bear at daybreak were astonishing. Fast machines in pairs, each carrying a number of 20-lb. bombs, sat over Jenin all day. Each pair of machines was relieved at pre-arranged intervals. Any movement on the aerodrome brought a bomb crashing about the ears of those responsible for it, and, in actual fact, the enemy never got

an austere and intensive diet, would never let me hear the last of it! As for me, a good dinner well garnished with wines, heady ones for preference, a fat cigar, and then the adversary is welcome to present himself. For this long distance race, the same thing, an all-little liqueur, a cigarette which I will throw into the water at the last minute, and they are welcome if they please, my little public, to line up to see me in the rôle of Undine or Triton, well knowing that they stand a better chance of seeing me at the start than at the finishing post!"

As for me, despite the ace's diffidence, I could not but believe in his amazing energy, that force which, while he was yet hobbling on crutches, enabled him to bring down a kite-balloon and two Rumplers in the same morning—the strength that enabled him to sneak back to the battle line unauthorised and account for four victims in one morning, when he was supposed to be convalescent at Dunkirk.

And surely enough, in leisurely fashion, harassed by his many wounds, and the disability of a leg that had been broken in several places, he won through! And when I felicitated him, he laughed at me, and said: "If I dallied a while on the way, it was only that I wished to reassure the fishes. They had been told that I was participating, and feared I might have brought a machine-gun along!"



a machine off the ground. As each machine was relieved its pilot dived down and sprayed the hangars with machine-gun bullets before making off for another load of bombs. The inability of the Turks to get a single machine into the air permitted our cavalry to execute its critical turning movement without being observed, with the result that Nazareth was entered at 3 o'clock the following morning.

As to the results obtained by the British flying men in their operations against the retreating enemy transport—groups of machines, leaving the ground at three-minute intervals, flew over and bombed the head of each column—an eye-witness said, "It was appalling. Men, horses, guns and oxen lay in tangled heaps. The crews of motor lorries abandoned their vehicles without stopping the engines. The lorries ran amok and finally overturned, thus increasing the confusion twofold."

These operations amounted to an outflanking of the enemy from the air, and his plan for retirement was completely upset. Never, probably, has there been a more tremendous demonstration than in these operations of the weight and power as a military auxiliary of the R.A.F.

### Death of M. Leon Morane

By the death of M. Leon Morane in Paris last week, France has lost one of her famous pioneers. He first came into prominence as a pilot of Bleriot monoplanes, and had a bad crash when starting off for a flight for a Michelin prize from Issy to the Puy de Dome in October 1910. Later he designed a monoplane on Bleriot lines, which he built in conjunction with M. Borel, and machines of this type achieved considerable success in various competitions, one of them being flown by Vedrines in the circuit of Britain. Subsequently, working with M. Saulnier, the Morane-Saulnier monoplane was produced. At the outbreak of war the Morane-Saulnier parasol monoplane was extensively used, and since then the firm has brought out several successful military machines including the Morane biplane and a big twin-engine bomber.

### America's Leading Ace

LIEUT. EDDIE RICKENBACHER, who before the war had won fame in the States as a driver of racing cars, is steadily adding to his total of German machines crashed. On October 16th he was officially credited with 18 victories—a record for the U.S. Army.

### French Honour for Capt. Wedgwood Benn

It was stated on October 17th that the President of the French Republic has conferred the Cross of Chevalier of the Legion of Honour on Capt. Wedgwood Benn, D.S.O., D.F.C., M.P.

### Paris-Raiding Centre Captured

COMMENTING on the capture of Sissonne, the *Petit Journal* says:—"The Germans had here an important aviation centre, and the Goths which have been bombing Paris started from this point."

# STEEL TUBES, TUBE MANIPULATION, AND TUBULAR STRUCTURES FOR AIRCRAFT\*

By W. W. HACKETT and A. G. HACKETT, of Oldbury, Birmingham

## Introductory

THE present decade will pass down into history notorious for many things good and bad. It will be styled a time of improvement in many ways. It will be remembered as covering the period of the world's greatest war, but it will also be remembered among all trades appertaining in any way to engineering as the age of progress in the manufacture and manipulation of steel tubing.

Independent altogether of the stimulus given to the use of tubing for structural work by the advent and advance of aeronautics, the uses to which tubing of steel and other metals is put has increased considerably during the past few years. Much, of course, has been due to the large output of cycles and motor cycles, but in addition an immense quantity of tubing is used in the construction of motor cars, and in a thousand other productions which it is unnecessary to particularise in this paper.

The section of tubular work in which we are more especially interested at the moment, however, is that which has relation to aircraft construction, and in this paper we hope to deal with some of the main features of this important subject, giving a brief review of the method of manufacture generally employed, of some of the difficulties that have had to be overcome, and of some of the forms of manipulation which it is possible to put upon good quality steel tubing. The latter part of the paper will deal with tests carried out on specimen tubes, under various conditions, and jointed together in different ways. All that we have to say will apply to seamless steel tubing.

## Seamless Steel Tubing

In dealing with such a subject as this other articles must be brought under review, such, for instance, as lugs and liners, as these enter so largely into the construction of articles built mainly of steel tubing. Mention will be made of cycle and motor cycle experience in the use and abuse of steel tubing.

Seamless steel tubing is a product of modern times, some 35 years having passed since the first experiment was successfully carried through. Its commercial production has often made possible the manufacture of articles which could not otherwise have been made, and in other cases it has been the means of popularising articles which were having a very small sale, and which were even looked upon as freaks. Many present will remember the old bicycles which were built of gas pipes and solid pieces of iron, and will have recollections of the energy taken to propel these machines, especially up an incline. The coming of seamless steel tubing soon altered that, and a few years later cycle frames were being built of light gauge tubing, enabling a man to propel himself at 10 to 20 m.p.h. on a structure weighing about 30 lbs. Two things made the cycle a commercial success: pneumatic tyres, which made riding more comfortable, and light-gauge steel tubing, which brought down the weight of the cycle to a minimum. A further word must be said for the pneumatic tyres, namely, that by minimising the shock to the frame they made possible the introduction of lighter gauge tubes than could otherwise have been safely used.

## How Seamless Steel Tubing is Made

To commence the manufacture of a seamless tube a solid billet of steel, well hammered and rolled, is taken. This billet must be carefully examined for various faults, and any lamination or surface defect removed by chipping, or else the outside of the billet must be turned all over. The usual practice when the latter is done is to turn about  $\frac{1}{8}$  in. off the diameter of the billet.

## Hot-Rolling

The first operation is then to pierce a hole. Two ways of doing this are in general use: one is by means of a hydraulic press, similar to the method of piercing shells so common in this country to-day; and the other, by means of a rotary piercing machine. The billet, first centred with large shallow holes, is heated to about  $1,200^{\circ}$  C. and fed between rolls having a curved outline and set at an angle which imparts a forward movement to the billet as it is rotated. Great pressure is used (which causes the billet to tend to open along its axis), and the billet is forced against and over a pointed mandrel held on the end of a stout rod, which butts against a bracket at a distance of about 7 ft. from the centre of the rolls. A billet, 4 ins. in diameter by 24 ins. in length, will be made in one operation into a tube about 4 ft. to 5 ft. long. The pierced billet is then taken to another machine which is pro-

\* A paper read before the Royal Aeronautical Society.

vided with upper and lower rolls having semi-circular grooves of various radii, and by a series of operations is rolled into a tube of the required size. The tube is passed over mandrels to give the required thickness.

A much quicker process of rolling mild steel tubes is by means of Pilger rolls; but for high carbon steel or chrome nickel steel this process has been found to be unsuitable.

## Cold-Drawing

The first operation in the cold-drawing mills is that of "tagging," the hollow bloom (as the rough rolled tube is called) being reduced at one end by suitable semi-circular tools in a power-forging hammer. The tube in the drawing operations to follow will be pulled through the dies by means of the "tag" thus formed. A small hole is also put into the tube at the point where the tag commences, in order to allow acid and water to work through the tube in the subsequent pickling and swilling processes. After being "tagged" the tube is annealed, pickled in a bath of acid to remove the scale, and then swilled in clean water. Following this the tube is dried and then immersed in a solution of soap, or in oil, to lubricate it for the drawing operation. It is now ready for drawing.

There are two methods of cold drawing in general use. One is by drawing down the outside diameter of the tube upon a long bar of uniform diameter and then passing the tube, while on the bar, through rolls fixed in a "reeling" machine, which is similar to that used in the rotary piercing operation. In carrying out this method the tube is put on to the bar, which must of necessity be smaller than the bore of the tube to be drawn. The tube and the bar are then pulled through a die of hardened steel of such a bore as will give the proper reduction of gauge to the tube. The tube is gripped on the "tag" by means of "dog" jaws sliding on inclined planes. The "dog" is moved along the draw-bench by hooks which are dropped into the links of an endless chain. The chains move at a speed of from 12 ft. to 35 ft. per minute, according to the class of material to be drawn. This process of cold drawing permits of a greater reduction of thickness at each draw than can be obtained by the more usual process of plug drawing, but is rather harsh on the material, and the expanding of the tubing (already hardened by drawing) to allow the mandrel to be extracted sometimes causes splits and fractures. These are more likely to appear if this process is used after the tube has been drawn to a light gauge.

The second method is that known as "plug drawing," and is more usually adopted. In this case a short, hardened mandrel, is screwed into one end of a long bar. This bar is screwed at the other end into a larger piece of steel known as the "back sleeve," which is screwed and fitted with a nut at either end. This sleeve has an axial movement of about 9 ins. in the back casting of the draw-bench. The nut at the back is used for the purpose of adjusting the position of the mandrel in relation to the die.

The tube is threaded over the mandrel and the "tag" is passed through the die, which rests against the die plate. Immediately the tube is gripped by the "dog" it commences to move, the mandrel at the same time being drawn forward into position by means of a rope or chain. A reduction in gauge thickness and diameter, with an increase in length, is the result, due to the walls of the tube being drawn down between the mandrel and the die. The usual reduction by this method is about a gauge and a-half per draw on low carbon steel. The operation of cold drawing hardens the tube to quite a large extent, and subsequent annealing is necessary.

## Annealing

A properly annealed tube showing an ultimate tensile stress of about 30 tons per square inch should give about 38 tons after undergoing the drawing operation. To properly prepare the tube for further cold drawing it is therefore necessary to anneal after every drawing operation, which means it has also to be pickled, washed, dried and lubricated. A hollow bloom  $1\frac{1}{2}$  ins. in diameter by 8 ins. gauge would require nine or ten "draws" to make it into a tube  $1\frac{1}{4}$  ins. by 22 ins. gauge. The annealing is carried out in suitable muffles, usually at a temperature of about  $600^{\circ}$  to  $650^{\circ}$  C., until before the last "draw," when a temperature of about  $850^{\circ}$  C. is advisable. In the case of light-gauge tubes, this should be done by "close" annealing, as the scaling and blistering of a light tube by "open" annealing would be fatal.

When a tube has been drawn to about  $\frac{1}{4}$  in. diameter there is great difficulty experienced in drawing on a mandril. The usual practice is to finish  $\frac{1}{8}$  in. diameter tubes and smaller by reducing the diameter only, termed "sinking." The condition of the tube finished in this way is not so good as when finished on a mandril, the strength of the tube being less. From experiments made, tubes from 0.5 per cent. carbon steel finished by "sinking" show about the same tensile strength as tubes from 0.35 per cent. carbon steel finished with the usual "draw" on a mandril.

#### Chrome Nickel Tubes

The advent of aeroplanes and airships has given rise to a demand for steel tubing of a higher class than before, tubes of high carbon and alloy steels being called for. This has meant careful investigation in order to find the best heat treatment to be accorded in each particular case. The first attempts at drawing chrome nickel steel were scarcely a success, and many breakages of mandrels and even draw-benches resulted from the unsatisfactory annealing of these tubes. Chrome nickel tubes are now being successfully drawn by the same methods as are used for mild steel tubing—by means of "plug drawing"—but very great care needs to be taken in the annealing.

The amount of reduction in gauge per draw is less than half that which is usual in the drawing of mild steel, but in spite of this the wear on mandrels and dies is very great.

A typical analysis of chrome nickel steel is as follows:—

	Per cent.		Per cent.
Carbon	.3	Manganese	.45
Silicon	.16	Chromium	1.10
Sulphur	.03	Nickel	4.00
Phosphorus	.03		

Such a steel, when air-hardened, has an ultimate tensile stress of about 100 tons, but a low elastic limit to a maximum value of about 70 tons. Tempering will raise the yield point and at the same time slightly reduce the ultimate stress. This steel is being much used for aeroplane axles. One feature that should be mentioned here is the very serious effect of sulphuric or muriatic acid on hardened chrome nickel steel tubing. It has the effect of making the material exceedingly brittle. Fig. 1 shows a piece of tubing cut from an axle and considerably ovalled, after being hardened, without splitting the tube; also one from the same piece that has been pickled. It will be seen that this has cracked, although the tube is still almost circular. It is therefore inadvisable to use acid to remove scale from a hardened chrome nickel steel tube; but the injurious effect of the acid can be almost entirely removed by suitable heat treatment.

Acid affects other high tensile steels in the same way, but to a less degree, and has a considerable effect even on mild steel.

#### Section Tubing

Section tubing has been extensively called for by aeroplane designers, and streamline tubing is sued to quite a large extent. The first streamline tube our company (Accles and Pollock, Ltd.) were asked to make was designed by Mr. Howard T. Wright in 1908, and is a section that is very near to the recognised standard of to-day. Section tubing, the streamline-shaped tube especially, is much easier to make if straight sides are avoided, as straight or concave sides compel the use of mandrels and add to the difficulty of production. There are three ways of making sections from seamless tubing, namely, by drawing, rolling and pressing. Pressing is only practicable on fairly short lengths. In drawing there is a slight reduction in periphery in passing from the round, but in rolling or pressing it remains the same.

#### Some Difficulties Overcome

It will be useful in this paper to review some of the trouble we have met with in connection with other trades where tubing has been used to a great extent, and to mention some of the failures, as the same or similar faults may occur in aeroplane construction. When the Bowden brake was first used on cycles and motor cycles the practice followed was to drill the tube near the handlebar lug to allow the cable to pass through, and this resulted in a large number of breakages. This difficulty was overcome by drilling the holes through the lugs; but many accidents occurred before this practice was adopted. Under an alternating stress a tube which has been drilled, unless properly reinforced, is very likely to fail.



#### Famous Germans Killed

Two of the leading German pilots have recently been killed, one being Lieut. Fritz Rumey, for whom 44 aerial victories were claimed, and the other Lieut. Höhn, credited with half that number.

A series of running rests on drilled and undrilled tubes has shown that when stressed up to near its elastic limit the undrilled tube has in many cases 10 to 20 times the life of the drilled tube. It is often the case that the harder the tube the greater the risk of breakage through a hole. One way of breaking a hard-drawn tube, adopted in tube mills, is either to "nick" the tube on one side with a file or to punch a hole in one side and then break by striking the tube on a block or anvil.

Quite recently we have carried out a large number of important tests on a special type of alternating stress testing machine which we had built. This machine, together with many of the tests carried out and the results achieved, was to a great extent due to the enthusiasm and foresight of Lieut.-Comdr. H. N. Wylie, R.N.V.R., and Lieut. R. W. Fieldwick, the resident A.I.D. Inspector at our works, and to whom we wish to express our thanks for help given.

Various results of tests carried out on the machine referred to will be given during the course of this paper.

#### Badly-Designed Cycle Lugs

Another series of failures was caused by unsuitable lugs. Some of those used in the earlier days of motor cycling had very strong outlets, and case after case of tube failure occurred. The tubing sometimes broke off so cleanly as to give the appearance of having been cut through. The broken tubing could be flattened, thus proving it was ductile and in a proper condition for its purpose. In order to prove that the fault lay in the excessive strength of the lugs, a series of experiments was carried out a number of years ago. A lug, as generally used, was tapered off at one outlet and left strong at the other. A piece of tubing of the usual gauge and quality was brazed into the lug, and the lug firmly secured to a plate. The ends of the two tubes were then moved by eccentrics and connecting-rods giving a  $\frac{1}{4}$ -in. movement at a speed of about 400 alternations per minute. Each time the experiment was tried the tube broke off cleanly close to the thick outlet, whereas the tube at the tapered outlet remained intact.

Chart No. 1 is a record of alternating stress tests taken to determine the value of "blueing" steel tubes. In these tests two types of grips were used, and two points were proved, namely, the beneficial effects of "blueing" and the increase in the life of a tube when held by a grip having a tapered outlet. Another interesting feature of the test was the spiral form of the break.

Another interesting test was as follows: After brazing the tube into a lug with respectively thick and tapered outlets, similar weights were applied to the ends. The tube in the tapered outlet bent with an easy curve, but that at the other end bent abruptly close to the thick outlet.

#### Front Forks for Cycles

It has been proved to the satisfaction of many cycle and motor-cycle engineers that to keep on merely increasing the gauge of a tube that appears to be too weak for its work is not always good practice. For instance, take the case of the front fork tube as used on the ordinary cycle. This tube has proved of ample strength for use on the excellent highways of this country, but for Continental roads something better was wanted. Some years ago we supplied a large quantity of front forks produced from 19-gauge tubes to Russian cycle manufacturers. We were asked to increase the thickness to 18-gauge, on account of a number of breakages occurring. We did so, but matters were not improved, and we were then requested to further increase to 17-gauge. There was still no improvement; indeed, the number of breakages increased. The forks all broke off where they were brazed into the crown, and we were asked by the Russian manufacturers to help them out of their trouble. One way of doing this would have been by using a suitable liner or sleeve, but we tried another method which proved quite successful. We brought back the gauge of the tubes to 19 where brazed into the crowns and tapered the gauge to 22 at the bottom ends. This proved effective; a lighter article by about 40 per cent., from the same quality steel, thus standing the strain successfully. This result is accounted for by the fact that the shock was more equally distributed along the tubing, due to the strength being reduced, gradually, away from the brazed portion, whereas in the plain gauge tubing the whole of the movement was concentrated in a very small space, near the crowns.

(To be concluded.)



#### German Machines in Holland

A GERMAN aeroplane landed in Holland on October 12th, and both occupants, an officer and a non-commissioned officer, were interned. A second machine landed three days later, and the pilot was similarly treated.

**Casualties**

Captain D. G. A. ALLEN, R.A.F., killed in action on October 8th, was the second son of Mr. A. W. Allen, of St. Pierre, Willesden Green. Born in 1890, he was educated at Merchant Taylor's School, where he gained his Rugby colours. He proceeded with a Sir Thomas White Scholarship to St. John's College, Oxford. He took a second class in Moderations and in the final schools, and was preparing for the Civil Service examination when war broke out. He received his commission in the Durham Light Infantry in 1915, but was attached to the R.F.C., serving as an observer throughout the Darfur Expedition. Returning to England, he qualified as a pilot, and served subsequently in France for nine months, was then employed for some time as an instructor at home, only recently returning to the front.

The Hon. RICHARD GERALD AVA BINGHAM, R.A.F., who was killed in action on October 17th on the Western front, was the youngest son of the late Lord Clanmorris, and brother of the present peer of that title. Born in 1896, he was educated at Cheltenham, and joined the R.A.F. just a year ago. He was one of five brothers in the King's service, one of whom, Commander the Hon. Barry Bingham, won his V.C. at the Battle of Jutland.

Lieutenant HUBERT W. CLARKE, R.A.F., who was previously reported missing, now reported killed in action on September 2nd, aged 19, was the second son of Mr. and Mrs. A. E. Clarke, The Hurst, Mottingham, Kent.

Lieutenant WALLACE JOHN CROCKETT, R.A.F., who was killed on September 19th, was the second son of Mr. and Mrs. Herbert Crockett, of Telford Court Hotel, Streatham Hill, S.W. He was educated at Emwell House School, Warminster, and at the Kilburn Grammar School, London, and on the outbreak of war in 1914 was holding a responsible position in Manchester. In 1915 he enlisted in the Artists Rifles, and went to France later on in the same year. In addition to a good deal of active service, he did much useful work in connection with engineering. In 1917 he volunteered for the R.F.C. and returned to England last summer, and after training was granted a pilot's commission in the R.A.F. He was detailed for work on the French front, and did useful work there, but developed throat trouble through flying at high altitudes. After a period of rest in England and special training for bombing, he was ordered to another front last August.

Lieutenant HUBERT WEEKS DRIVER, R.A.F., who has been officially reported killed, aged 20, was the eldest son of Mr. and Mrs. Arthur Driver, of Gill College, Somerset East, South Africa. After matriculating at Gill College, he proceeded to the South African College (now the University of Cape Town), where he took up engineering. It was during his second year at the university that he volunteered for the flying service. For his training he went to Egypt, and after gaining his "wings" and serving on that front he returned to England last July, and shortly afterwards proceeded to the front.

Second Lieutenant WILLIAM GEORGE FRANCIS, R.F.C., reported missing on March 10th last, and now reported killed on that date, aged 19, was the younger son of Mr. and Mrs. Arthur Francis, formerly of Avenue Lodge, St. Leonard's Road, Eastbourne. He was educated at Eastbourne College, where he was in the O.T.C., and joined the Artists Rifles O.T.C. in February, 1917. In the following May, however, he transferred to the R.F.C., in which he obtained his "wings" as pilot in October, and left for the Italian front on December 10th, 1917.

Lieutenant TREVOR LEONARD OSBORNE, attd. Devonshire Regt., and formerly of the R.A.F., who was killed in action on September 30th (previously reported wounded), aged 19, was the youngest son of Mr. and Mrs. W. N. Osborne, Brixton Hill, S.W.

Sec. Lieut. CYRIL HAYES SAWYER, R.A.F., who was killed in France on October 8th, aged 19, was the son of Mr. James

Sawyer, Pewsey Villa, Tolworth, Surbiton. He joined the Army in May, 1917, when he was sent to a training battalion, and afterwards transferred to the R.A.F. and given a commission.

See. Lieut. RALPH FREDERICK TALBOT, R.A.F., who was killed on September 2nd, was the second son of Arthur Warburton Talbot, of Montreal, and formerly of Deal, and was aged 20. Educated at Sir Roger Manwood's School, Sandwich, he went to France from Canada with the 24th (Victoria) Rifles in 1915, and was wounded in 1916. He obtained a commission in the R.A.F. last August. His elder brother, Sec. Lieut. A. C. Talbot, Essex Regt., died of wounds in 1916.

Captain DENYS C. WARE, M.M., R.A.F., who was killed in action on September 20th, was the youngest son of G. S. Ware, St. Aubyn, Jersey.

Lieut. GAVIN FERGUSON YOUNG, R.A.F., who was reported missing on September 2nd and now reported killed in action or died of wounds, aged 19, was the second son of Frank Young, 45, Gwendolen Avenue, Putney.

Lieutenant J. M. G. BELL, M.C., R.A.F., who died on October 3rd of wounds received on October 1st, aged 27, was the eldest son of Mr. and Mrs. Richard Bell, of Sooke, Canada, formerly of Belfast. He came to England with the First Canadian Contingent in 1914, and later joined the R.F.A. He was awarded the M.C. for gallantry at Cambrai in November, 1917. He afterwards transferred to the R.A.F.

Lieutenant ARTHUR NOEL BUCHANAN, R.A.F., who died of pneumonia on October 14th while on leave from the front, aged 33, was the second son of Sir John and Lady Buchanan, of Clareinch, Claremont, Cape Town.

Lieut. COLIN TOSSED COLERIDGE, R.A.F., who was killed on July 23rd in an aeroplane accident at Deseronto, Ontario, where he was acting as instructor, was the son of Mr. John Coleridge, of Snettisham, Norfolk. Lieut. Coleridge, who was 29 years of age, had just received a first-class certificate for flying, and has been gazetted M.B.E., in recognition of "saving life at the great risk of his own" and while in great personal suffering, when stationed at Fort Worth, Texas, last February. Mr. John Coleridge has just received his son's decoration.

Second Lieutenant DENIS HUGH GRIGG, R.A.F. (late R.N.A.S.), who was killed abroad on October 11th, while flying, aged 19, was the second son of F. C. and R. L. Grigg, of Yvetot, Downs Court Road, Purley.

Lieutenant ROBERT STANNARD HERBERT, R.A.F., who died abroad on October 8th shortly after a collision in the air, was 19 years of age, and son of Mr. and Mrs. Leonard Herbert, of Argyll Mansions, W. 14. He was educated at Bedford School, had only just joined his squadron, and had been offered an instructorship in England, but made special application for active service abroad.

Captain JOHN HERBERT TOWNE LETTS, M.C., R.A.F., who died on October 11th abroad, through an accident while flying, aged 21, was the only child of Walter and Helen Letts, Steep Hill House, Lincoln.

Second Lieutenant ROBERT AUBREY HASTINGS LLOYD, R.A.F., who died on October 14th at a casualty clearing station of wounds received in action, on October 10th, aged 18, was the youngest son of Mr. and Mrs. E. W. M. Lloyd, Hartford House, Hartley Wintney, Hants.

Lieutenant R. S. RUCKER, R.A.F., who died on October 12th of wounds received the previous day, was the third son of the late E. A. Rucker, and Mrs. Rucker late of Cudham Hall, Sevenoaks.

Captain FRANCIS BALFOUR SEDGWICK, R.A.F., who was accidentally killed while flying, aged 22, was the younger son of the late Professor Adam Sedgwick and Mrs. Sedgwick, 4, Alfred Place, S.W.

Lieutenant C. E. SHERLOCK, R.A.F., who was killed while flying on August 20th, was the younger son of Mrs. R. E. Sherlock, of Lethbridge, Alberta, Canada. He joined the 2nd Brigade C.R., and came to England early in the spring of 1915. He was twice wounded in France. Last January he passed into the R.A.F.

Captain BENJAMIN STEWART BUCKINGHAM THOMAS, M.C., who was killed in France on October 4th by an accident while flying back from a patrol, was the son of Mr. and Mrs. Thomas, of 71, Gwyther Street, Pembroke Dock. Captain Thomas, who was 24 years of age, was formerly in the 9th Welsh Regt., had been awarded the Military Cross and was decorated in France on January 7th, 1917. He was gazetted captain on January 29th, 1917. He joined the Flying Corps on September 1st last year and went out to France on Easter Monday. Captain Thomas's brother, Mr. J. D. G. Thomas, has recently joined the R.A.F.

Lieut. CLAUD HANDLEY TROTTER, R.A.F., who has been killed while flying, aged 23, was the son of the Rev. J. C. Trotter, of Ardrahan Rectory, Co. Galway. He had a distinguished career in the Canadian Force and as an observer for many months in France.

Second Lieutenant MICHAEL ANTHONY WATERER, R.E., attd. R.A.F., who died at a casualty clearing station on October 11th from wounds received on the 8th inst., aged 24, was the son of Robert and Gertrude Waterer, of Elmside, Chertsey.

#### **Married**

Captain J. COLIN CAMPBELL AFFLECK, R.A.F., son of the late J. Murray Affleck and Mrs. Affleck, High Wycombe, was married on October 17th at St. Cuthbert's, Darlington, to SIBYL, daughter of Dr. EUSTACE HILL, O.B.E., and Mrs. Hill, of Darlington.

Lieutenant GEOFFREY MURLAND ATKINSON, R.A.F., son of the late Richard Atkinson, Esq., of Temple Sowerby, Westmorland, was married on October 16th at St. Augustine's, Stepney, to MARY AGNES FRANCES DIANTREE, only daughter of Captain J. D. Daintree, R.N., and granddaughter of Rear-Admiral Kelly.

Lieutenant CEDRIC IAN BURRELL, R.E., attd. R.A.F., son of Mr. and Mrs. Burrell, of Newcastle, was married on October 12th at St. Mary Abbots, Kensington, to MARIA, second daughter of J. BATALHA-REIS, Portuguese Minister in Russia, and of the late Mme. J. Batalha-Reis.

Capt. BRIAN C. RIGDEN, M.C., Oxford and Bucks L.I., son of the late Capt. W. O'BRIEN RIGDEN, was married at Christ Church, Lancaster Gate, W., to DOROTHY, only child of Col. W. E. S. BURCH, R.A.F., and Mrs. Burch, Birchwood, Fleet, Hants.

Lieutenant LEONARD WAIGHT, Int. Corps and R.A.F., second son of Mr. and Mrs. F. H. Waight, was married on October 11th at St. Barnabas' Church, London, N.W., to RUBY, eldest daughter of Mrs. WEEKES and the late Rev. R. Weekes, M.A.

## ◆ ◆ ROYAL AERONAUTICAL

THE following is the programme of lectures which have been arranged by the Royal Aeronautical Society for their 54th Session. Except in the case of the opening lecture on November 8th, the popular lecture on December 11th and the Juvenile Lecture on January 8th, the meeting-place will

Date.	Subject.	Lecturer.	Chairman.
Nov. 8	Fighting in the Air .. ..	Capt. Cochrane Patrick, R.A.F. .. ..	Major-Gen. Brancker.
Nov. 20	Stress Optical Experiments .. ..	Major A. R. Low, R.A.F., M.A. .. ..	—
Dec. 5	Shop Practice in Respect to Aircraft Steels	Brig.-Gen. R. K. Bagnall Wild, C.M.G., R.E. .. ..	Sir Robert Hadfield, F.R.S.
Dec. 11	Civil Aerial Transport .. ..	Claude Grahame-White .. ..	Lord Northcliffe
Dec. 18	Full Scale Aeroplane Experiments ..	Capt. W. S. Farren, C.B.E. .. ..	Lt.-Col. M. O'Gorman, C.B.
1919	Jan. 8 To Constantinople and back by Aeroplane	F. Handley Page, C.B.E. .. ..	Major Alan H. Burgoyne, M.P.
Jan. 15	Medical Aspects of Aviation .. ..	L. E. Stamm, B.A., B.Sc., M.D., R.A.F. .. ..	Sir Alfred Keogh, G.C.B., M.D.
Jan. 29	Rigging of Aeroplanes .. ..	Capt. R. J. Goodman Crouch, R.A.F. .. ..	Lt.-Col. A. Ogilvie, R.A.F.
Feb. 12	Fabrics and Dope .. ..	F. W. Aston, R.A.E. .. ..	—
Feb. 26	Points on Aeroplane Design .. ..	Capt. F. S. Barnwell, R.A.F. .. ..	Gen. J. Weir, R.A.F.
Mar. 12	From Model to Full Scale in Aeronautics	H. Levy, N.P.L. .. ..	Dr. T. E. Stanton, F.R.S.
Mar. 26	Lighter than Air Craft .. ..	Lt.-Col. T. R. Cave-Brown-Cave, R.A.F. .. ..	Brig.-Gen. E. Maitland, D.S.O.
Ap. 26	Aluminium Alloys for Aeroplane Engines	Prof. T. C. Lea, F.R.S. .. ..	Lt.-Col. Jenkyn.

Discussions will take place after each lecture, and tickets may be obtained from the Secretary, Mr. W. Barard Faraday, 7, Albemarle Street, W. 1.

#### **To be Married**

The engagement is announced between Captain ATHOL D. COLLINS of the Worcestershire Regt., attd. R.A.F., son of D. George Collins, C.C., Shirley Park, Croydon, and Miss AGNES RUSSELL, only daughter of Mrs. E. Russell, of Downham Market.

An engagement is announced between Captain EVELYN C. W. FITZHERBERT, D.S.C., R.A.F., son of Arthur Vesey FitzHerbert, of Ballentere Hall, Dundrum, Co. Dublin, and ENID, elder daughter of the late HAROLD WOOLLRIGHT, barrister-at-law, and Mrs. F. O. Erichsen, of 14, Vale Avenue, Chelsea.

The engagement is announced of Lieut. CECIL L. J. GARRARD, Middlesex Regt. and R.A.F., eldest son of Mr. and Mrs. L. G. Garrard, Willesden, London, and SARAH (V.A.D., serving in Egypt), third daughter of the late WILLIAM JOS. SMITH, J.P., and of Mrs. Margaret Smith, 1, Bellvue Terrace, Johnhill, Waterford, Ireland.

The engagement is announced between Mr. G. DENHAM JENKINS, Hampshire Regt. and R.A.F., son of the late Captain and Mrs. Walter Jenkins, of Bournemouth, and ALISON LEONORA, daughter of the late Mr. HARRY DOW WHITE, of Twickenham, and of Mrs. Charles Dew.

The marriage arranged between Lieut. J. E. MARIGOLD, R.A.F., and JOYCE MATTHEY will take place on November 7th at St. James's Church, Piccadilly, at half past two o'clock.

A marriage has been arranged, and will take place at the Church of the Annunciation, Bryanston Street, on November 5th, at 10, between Major GEORGE MOSER, R.A.F., son of Mr. George Moser, of Kendal, Westmorland, and GLADYS, younger daughter of Mr. W. H. MOBERLY, of Southampton.

A marriage has been arranged, and will shortly take place, between Lieut. JOHN HENRY BERTRAM RYGATE, 6th Dragoon Guards (Carabiniers), attd. R.A.F., only son of Dr. Bertram Rygate and Mrs. Rygate, of Sizewell, Leiston, Suffolk, and IONE KATHARINE, only daughter of Dr. SAMUEL RIDEAL, J.P., and Mrs. Rideal, of 48A, Cornwall Gardens, South Kensington, and The Chalet, Elstead, Surrey.

The marriage arranged between Mr. W. M. YOOL, Jun., R.A.F., eldest son of Mr. W. M. Yool, Elgin, and Miss C. G. MILTON, daughter of Mr. M. H. Milton, 23, Sussex Place, Regent's Park, will take place shortly.

#### **Items**

PRINCESS ARTHUR OF CONNAUGHT, attended by Lady Evelyn Farquhar, motored from town to Kingston-on-Thames, on October 21st, and inspected the works of the Sopwith Aviation Company, over which she was conducted by Mr. and Mrs. T. Sopwith and Mr. H. Carey, the managing director. Her Royal Highness afterwards visited the club recently opened for women workers, where she took tea with the committee.

Lady CAVE was present at the dedication, in St. Matthias's Church, Richmond, of a flag presented by Mr. J. A. Whitehead to the Richmond Division Girl Guides.

## ◆ ◆ SOCIETY'S LECTURES

be the theatre of the Royal Society of Arts, John Street, Adelphi, W.C. The three special lectures will be held in the Central Hall, Westminster. With the exception of the Juvenile lecture, which will be held at 3 p.m., the lectures will commence at 7.45 p.m.

Date.	Subject.	Lecturer.	Chairman.
Jan. 29	Rigging of Aeroplanes .. ..	Capt. R. J. Goodman Crouch, R.A.F. .. ..	Lt.-Col. A. Ogilvie, R.A.F.
Feb. 12	Fabrics and Dope .. ..	F. W. Aston, R.A.E. .. ..	—
Feb. 26	Points on Aeroplane Design .. ..	Capt. F. S. Barnwell, R.A.F. .. ..	Gen. J. Weir, R.A.F.
Mar. 12	From Model to Full Scale in Aeronautics	H. Levy, N.P.L. .. ..	Dr. T. E. Stanton, F.R.S.
Mar. 26	Lighter than Air Craft .. ..	Lt.-Col. T. R. Cave-Brown-Cave, R.A.F. .. ..	Brig.-Gen. E. Maitland, D.S.O.
Ap. 26	Aluminium Alloys for Aeroplane Engines	Prof. T. C. Lea, F.R.S. .. ..	Lt.-Col. Jenkyn.

The Wilbur Wright Lecture will be given in May, and the Annual General Meeting of the Society will be held on March 19th.

# THE ROYAL AIR FORCE

*London Gazette, October 15th.*

The following temporary appointments are made:-

**Brigadier-General Administration.**-Lieut.-Col. J. A. Houison-Craufurd, and to be Temp. Brig.-Gen. while so employed, vice Lieut.-Col. (Temp. Brig.-Gen.) B. C. Fellows; Oct. 1st.

**Staff Officer, 3rd Class.**-(Air). Lieut. J. Patrick, and to be Temp. Capt. while so employed; June 10th.

*Flying Branch.*

Capt. H. H. Balfour, M.C., to be Temp. Maj. while employed as Maj. (A.); Sept. 17th.

Lieuts. to be Temp. Capts. while employed as Capts.:-A. W. E. Reeves; July 18th. R. Bolton; Sept. 9th. J. S. McDonald; Sept. 17th. W. J. Pace, D.F.C.; Sept. 20th. M. R. James, D.F.C.; Sept. 23rd. H. S. Preston; Sept. 27th. R. Sykes. J. D. I. Hardman, T. C. Trail, A. H. Burt; Sept. 28th. R. E. Dodd, R. Russell; Sept. 30th. G. A. Flavelle; Oct. 1st. R. Johnstone, A. T. Drinkwater, E. E. Wright; Oct. 2nd. M. A. Newman, B. E. Barnum; Oct. 3rd. C. E. H. Allen, F. J. Phillips, G. W. Biles; Oct. 4th. I. Welby, M.C.; Oct. 8th.

Lieuts. to be Temp. Capts. while employed as Capts. (A. and S.):-W. R. Curtis; July 29th. E. C. R. Stoneman, J. K. A. Jeakes; Sept. 9th.

Lieut. H. M. Golding to be Temp. Capt. while employed as Capt. (O.); Oct. 9th.

F. G. Browne (late F./Sub-Lieut., R.N.A.S.) is granted a temp. commn. as Lieut. (A. and S.); Sept. 14th, but with seniority (without pay and allowances) from April 1st, and to take prec. next below R. Harris.

Lieut. (Hon. Capt.) G. M. Puckridge to be Lieut. (A.), and to be Hon. Capt. from Obs. Officer.; Sept. 21st.

Lieuts., Observer Officers, to be Lieuts. (A.):-K. C. Leslie; Sept. 22nd. L. M. Glover; Sept. 24th. W. J. Corney, E. W. Trotman; Sept. 25th. H. J. L. Kirkpatrick; Sept. 28th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A.):-W. N. Broad, J. H. Shaw, H. B. Morris, P. Richardson, G. W. Fitchie, R. Maynard, G. F. Young; Sept. 20th. R. Woodhead, H. C. Pendle, C. W. Pape, A. V. Heslop, H. E. Filmer, H. F. Walters, R. N. Bullock, J. F. Gaffney, D. C. Watson, F. G. Sinclair, E. V. W. Cornabie, W. J. Wickens, G. W. Yallop, G. Biddell, J. G. Nicholls, F. R. Steggall, R. J. N. McGuire, F. J. Smith, R. S. Nicholl, T. Raitton, W. J. W. Potter, F. C. L. Young, J. H. Gibson, G. A. Atkinson, R. D. Quin, G. Turner, W. Mills; Sept. 30th. C. H. Leng, F. L. D. Crump, A. Sydall, E. W. Foster; Oct. 1st. A. L. Matson, E. F. Hodgson A. Watson, S. A. Scriven; Oct. 2nd. E. Wrangham, R. Coombes-White, H. A. Graham; Oct. 3rd. C. B. Parsons; Oct. 4th. R. C. Duncan; Oct. 5th.

The following Prob. Flt. Offrs. (late R.N.A.S.) are granted temp. commns. as Sec. Lieuts. (A.):-C. V. Ronchi; Sept. 20th. P. L. T. Lewin, E. G. King; Sept. 21st. C. K. Carter; Sept. 22nd. A. G. Marshall; Sept. 23rd. J. E. Jackson; Sept. 24th. J. D. Podmore, A. B. Beesley; Sept. 25th. G. H. Whitehead; Sept. 28th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their ranks as Sec. Lieuts. (A.):-N. S. Swan; July 15th. G. M. Trundle; July 19th. H. A. O'Donnell; July 26th. W. M. Gourlay; Aug. 18th. G. S. Daniel; Sept. 19th. G. O. Ford; Sept. 22nd. C. J. Bevan, D. D. McAlpin, J. H. Lorimer, L. S. Harvey, L. O. B. Russell, A. Holdsworth, F. N. Hargrave; Sept. 23rd. S. F. Morrisey, G. S. Fenwick, V. Lock, R. W. F. C. Frost, M. Arias, G. D. Green, J. C. Crawford, J. W. Abray, L. M. Pickwick; Sept. 24th. A. G. Baker, T. Dixon, E. Taviner, W. P. Taitavall, H. S. Battling, L. S. Barlow; Sept. 25th. H. M. Tudor, W. H. Bennett, L. S. Mersh, C. F. Robinson, H. Mason, L. D. Delapina; Sept. 26th. J. Hyde, W. A. Down, H. C. B. Brudenell; Sept. 27th. J. Burt, R. G. Burns, L. A. Brais, C. G. Knowles, P. H. Clarke; Sept. 28th.

The following are granted temp. commns. as Sec. Lieuts. (A.):-H. E. Holmes (Sec. Lieut., R.G.A., T.F.); Sept. 19th. R. H. Thompson (Temp. Sec. Lieut., Rif. Brig.); Sept. 22nd. R. H. Stonemill, M.M. (Temp. Lieut., R. Lanc. R.), and to be Hon. Lieut.; W. Garbett (Sec. Lieut., E. York R., S.R.); H. M. P. Hewett (Capt., Dgn. Gds.), and to be Hon. Capt.; Sept. 23rd. R. Girvan (Lieut., Sco. Rif., S.R.), and to be Hon. Lieut.; E. G. Bermejo (Temp. Sec. Lieut., Ches. R.); Sept. 24th. A. D. McDonald (Temp. Sec. Lieut., Essex R.); H. I. Marsh (Temp. Sec. Lieut., Glouc. R.); G. H. Pascal (Sec. Lieut. R.F.A., S.R.); B. A. Greenfield (Temp. Sec. Lieut., Worc. R.); H. V. Edwards (Temp. Sec. Lieut., R. Suss. R.); J. G. J. McDermont (Sec. Lieut., Lein. R., S.R.); W. J. D. Shore (Sec. Lieut., Lond. R., T.F.); Sept. 25th. G. Dania (Lieut., R.F.A., S.R.), and to be Hon. Lieut.; L. F. Ashley (Sec. Lieut., W. York R., S.R.); P. Pyne (Lieut., Lond. R., T.F.), and to be Hon. Lieut.; A. Thom (Temp. Sec. Lieut., Durh. L.I.); Sept. 26th. G. H. Turner, M.C. (Lieut., R.F.A., S.R.), and to be Hon. Lieut.; Sept. 27th. A. G. Palin (Temp. Sec. Lieut., K.R.R.C.); F. C. Farrington, M.C. (Sec. Lieut., R.F.A.); E. Shufflebotham (Temp. Sec. Lieut., R. Fus.); Sept. 28th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (S.): F. Tomlinson; Oct. 2nd. D. H. Jones; Oct. 3rd. S. H. Hall, P.F.O. (late R.N.A.S.), is granted a temp. commn. as Sec. Lieut. (S.); Sept. 26th.

H. W. Lester (late F./Sub-Lieut., R.N.) is granted a temp. commn. as Sec. Lieut. (A. and S.), and to be Hon. Lieut.; Oct. 14th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A. and S.):-G. E. Cartwright; April 22nd. A. E. Millar; June 22nd. J. A. Woodhead; July 6th. C. M. Taylor; July 12th. S. A. Lane; July 13th. J. Wallis; July 14th. A. E. Johnson, T. W. Hart; July 16th. P. Thomas; July 19th. O. E. Coleman; July 19th. C. D. Adams; July 21st. C. Bunch, L. W. John; July 25th. R. H. Byrom, M. Graham; July 27th. A. Turner, A. E. Page; July 29th. H. Godfrey, H. J. Randall, T. W. Ashton; July 30th. H. H. Purkis; Aug. 2nd. J. S. Napper; Aug. 3rd. H. F. Fisher; Aug. 10th. H. A. Denny; Aug. 17th. E. C. McCall; Aug. 23rd. P. A. Liebenberg, S. A. Pindar; Aug. 24th. A. B. C. Emmett, J. D. Farquharson, J. Hogg; Aug. 31st. R. H. Dures, R. R. Nott; Sept. 6th. J. A. P. Hunt; Sept. 20th. E. H. Halley; Oct. 5th. W. G. Howse, C. W. Mann, J. L. Morton, F. J. J. Paquet, V. T. Harris, R. B. Maxwell, B. B. Melville, H. C. Munro, J. S. Morton, E. T. Mills, R. T. Riley, S. G. Kiddie, A. Nicholson, C. B. Todd, W. D. Sendin, C. P. Smith, J. Ramage, L. P. Shipp, R. H. Hartle, J. L. Merrington, C. W. Travers, W. C. B. Ashfield, W. G. Staple, J. V. Melville, C. M. Hill, A. H. C. McGivern, J. E. Knaggs, H. I. Magid, A. E. Mallinson, A. R. De-Villiers-Van-Os; Oct. 12th.

The following officers are antedated in their appointments as Sec. Lieut. (A. and S.) with effect from the date stated:-G. A. Kelley; July 30th (name incorrectly stated G. A. Kelly, P. 10552, L.G., Sept. 6th. W. M. Crofton; Aug. 5th).

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (Obs. Officers):-A. M. Anderson; April 18th. T. B. Lamble, T. W. Rowlands; May 25th. E. V. L. Keating, H. Park, E. Smith; July 13th. W. R. H.

Porter, E. L. Mobbs, H. S. Laidlaw, G. Brown, L. T. Rennie, F. W. Harrison S. W. H. Reynolds; Aug. 4th. R. Baird; Sept. 2nd. A. V. Hawkins, F. W. Ball, H. S. Bodcock, W. M. Hall, G. H. Ellingham, D. H. Sutherland, H. A. Floyd, R. S. Stainsby, J. F. Rowbotham, M. H. Molyneux, A. Bruton, T. Stroud; Oct. 7th. H. W. Phillips, J. M. Theaker, N. J. Spencer, S. L. Cox, B. Ibison, H. V. Peberdy, A. E. Gwyther; Oct. 9th. D. M. Fraser, H. P. C. Green, P. D. Broughton, J. Morton, E. B. Owen, L. H. Ransom, C. De Lanbenque, E. H. Leavers, G. Harvey, I. H. Jenkins, H. C. Monckton; Oct. 10th. E. F. Sadler, F. H. Reed, J. E. Wildish, J. J. V. Barlow, R. E. Nixon, E. Dodgson; Oct. 12th. L. G. Newman, W. B. H. Eaton, A. R. Murray, W. J. Brain; Oct. 13th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (Obs. Officers):-W. Reader, F. E. Proctor, W. Blackburn, J. W. Kelland, N. F. Hirst, A. D. Neish; June 21st. E. G. Holloway; Sept. 26th. J. P. Coleman (date of first commn. Dec. 13th, 1917); J. Smith (date of first commn. Nov. 8th, 1917); Sept. 28th. F. Bland; Sept. 30th.

The following are granted temp. commns. as Sec. Lieuts. (Observer Offrs.): G. L. Parkinson, M.C. (Lieut., Durh. L.I., T.F.), and to be Hon. Lieut.; H. Reddaway (Lieut., R. Fus., S.R.), and to be Hon. Lieut.; J. C. Roadhouse (Temp. Sec. Lieut., York and Lanc. R.); H. G. Strange (Temp. Lieut., Middx R.), and to be Hon. Lieut.; June 21st. D. McDiwiddle (Temp. Capt., R.E.), and to be Hon. Capt.; Sept. 10th. I. H. Stockwood (Temp. Capt., Tank Corps), and to be Hon. Capt.; A. L. A. M. Pitot (Sec. Lieut., R.E.); R. C. Jones, M.C. (Temp. Capt., Rif. Brig.), and to be Hon. Capt.; Sept. 13th. L. F. Edwards (Lieut., Essex R., T.F.), and to be Hon. Lieut.; Sept. 17th. W. F. F. Harwood (Temp. Sec. Lieut., Norf. R.), T. Welsh (Sec. Lieut., R. War. R., S.R.); Sept. 20th. L. Aldden (Sec. Lieut., Lond. R., T.F.); Sept. 23rd. N. W. Read (Temp. Lieut., E. York R.), and to be Hon. Lieut.; C. M. W. Elliott (Sec. Lieut., E. Lanc. R., T.F.); Sept. 24th. J. S. Maquire (Lieut. N. Staffs R., S.R.), and to be Hon. Lieut., J. C. McIlroy (Lieut., R.F.A., T.F.), and to be Hon. Lieut., W. Seagram (Sec. Lieut., R.F.A., S.R.); H. S. Openshaw, M.C. (Temp. Capt., E. Surr. R.), and to be Hon. Capt., J. F. Swindells (Lieut., Ches. R., T.F.), and to be Hon. Lieut.; Sept. 25th. H. McF. Crichton, M.C. (Lieut., R. Scots, T.F.), and to be Hon. Lieut., J. G. Hadden (Lieut., R. Scots, T.F.), and to be Hon. Lieut., E. D. Buckland (Sec. Lieut., Lond. R., T.F.); Sept. 26th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (Dir.): G. E. Page, A. G. Peake, L. S. Anderson, F. A. Matthews, G. Fraser, P. H. Deniesen, A. O. C. Cox, A. Bent, T. V. Beatty, A. Rouse, C. D. Insall; Aug. 21st.

The following Capts. relinquish their commns. on account of ill-health, and are granted hon. rank of Capt.: -E. L. Ford, A. W. J. Ashe; Oct. 16th.

Lieut. R. P. Atwood relinquishes his commn. on account of ill-health, and is granted hon. rank of Lieut.; Oct. 16th.

Lieut. W. R. H. Standing relinquishes his commn. on account of ill-health contracted on active service, and is granted hon. rank of Lieut.; Oct. 16th.

Lieut. C. C. French (Lieut., R.F.A., S.R.) relinquishes his commn. on account of ill-health contracted on active service; Oct. 16th.

Lieut. R. C. B. Riley (Lieut., War. Yeo., T.F.) relinquishes his commn. on account of ill-health caused by wounds; Oct. 16th.

Lieut. T. E. Blears (Lieut., Lanc. Fus., T.F.) relinquishes his commn. on ceasing to be employed; Oct. 1st.

Lieut. R. D. Forbes resigns his commn.; Oct. 16th.

The following Lieuts. relinquish their commns., having been found permanently unfit for further instruction as pilots or observers:-R. D. Buxton, E. C. Matthews; Oct. 19th.

The following Sec. Lieuts. relinquish their commns., having been found permanently unfit for further instruction as pilots or observers:-R. McCullough, F. S. Legg, T. U. J. Nicholas, H. J. Morn; Oct. 16th.

The following Sec. Lieuts. relinquish their commns., having been found permanently unfit for further instruction as pilots or observers:-W. R. Evans, A. E. Ross, W. E. Brotherton, E. L. Day, R. Pattison, R. Smith; Oct. 19th.

Sec. Lieut. L. J. Evans (Sec. Lieut., Linc. R., T.F.) relinquishes his commn. on account of ill-health; Oct. 16th.

The Christian names of Sec. Lieut. Alexander Vallance Campbell are as now stated, and not as in the *Gazette* of Oct. 4th.

The notification in *Gazette* Aug. 23rd concerning Sec. Lieut. R. E. York is cancelled.

*Administrative Branch.*

Capt. D. E. Garnett to be Capt., from (T.); Aug. 19th.

Lieuts. to be Temp. Capt. while employed as Capt.: -H. F. Walker, from (A.); April 10th. R. M. Spence; Sept. 1st. H. D. A. Dart; Sept. 13th. N. B. Murphy; Oct. 1st.

Sec. Lieut. (Hon. Capt.) R. Falcon-Cooke to be Temp. Capt. while employed as Capt.; Oct. 5th.

Lieut. (Temp. Capt.) T. V. L. Hall to be Lieut., and to relinquish the temp. rank of Capt.; Sept. 1st.

Lieuts. to be Lieuts.: -O. J. Gagnier, from (A.); June 13th. N. S. Wolfdale, from (O.); Aug. 9th. G. M. Atkinson, from (A.); Aug. 24th. J. D. S. Denholm, from (O.); Aug. 25th. W. Law, from (O.); Aug. 28th. F. F. Sinclair, from (A.); O. Clayton, from (A.); A. E. R. Aldridge, from (O.); Sept. 7th. H. E. Hall, from (O.); C. L. Shaw, from (O.); Sept. 9th. R. H. Shepherd, from (O.); Sept. 14th. J. Pilkington, from (O.); Sept. 17th. (Hon. Capt.) A. G. A. Hodges, from (K.B.); Sept. 19th. F. R. Hunt, from (A.); R. Massey, from (K.B.); Sept. 24th. W. G. Gunning, from (A.); Oct. 5th.

Capt. R. C. Talbot reverts to Lieut. (K.B.) at his own request; Sept. 30th.

Sec. Lieuts. to be Temp. Lieuts. while employed as Lieuts.: -(Hon. Lieut.) F. E. Gauntlett; Aug. 24th. (Hon. Lieut.) G. A. McMillan; Sept. 23rd. P. Gent; Oct. 6th.

Sec. Lieut. H. Preston to be Sec. Lieut. from (A.); Sept. 28th.

Sec. Lieuts. (Obs. Officers) to be Sec. Lieuts.: -E. J. Munson; Aug. 27th. H. G. Hooker; Sept. 21st. R. W. Blundell; Sept. 23rd. G. P. Colin; Sept. 24th.

Sec. Lieuts. (T.) to be Sec. Lieuts.: -H. L. Whitelaw; Aug. 29th. L. B. Lewis; Sept. 2nd. P. W. Renshaw; Sept. 21st. E. O. Byam; Sept. 30th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts.: -H. la T. Templeton; July 27th. L. B. Lyle C. H. Gresswell; Aug. 20th. C. G. Rickards; Sept. 12th. T. A. E. Layborn; Sept. 14th. W. J. Scarff; Sept. 18th. W. J. C. Brown; Sept. 19th.

L. B. Mills, M.C. (Temp. Capt.), attd. E. Surr. R., is granted a temp. commn. as Capt.; April 1st.

A. Innes, M.C. (Capt., R. Highs., T.F.), is granted a temp. commn. as Capt.; April 1st, and to be Temp. Maj. while holding a special appointment at the Ministry of Munitions; May 24th.

H. Pooley (Temp. Lieut., attd. Glou. R.) is granted a temp. commn. as Lieut.; April 1st, and to be Temp. Capt. while holding a special appointment at the Ministry of Munitions; May 24th.

J. J. S. Naylor (Lieut., R.N.V.R.) is granted a temp. commn. as Capt.; July 30th.  
H. McDennell (Qmr. and Capt., Spec. List) is granted a temp. commn. as Capt.; Oct. 3rd.

The following are granted temp. commns. as Lieuts. — G. B. Booth (Lieut., Middx. R.), F. R. Haggis (Temp. Lieut., Res. Rgt. of Cav.); Sept. 27th. M. A. Trotter (Capt., Norf. R., T.F.), and to be Hon. Capt.; Sept. 30th. H. Butler (Lieut., Dorset R.); Oct. 1st. F. V. Goode (Lieut., Dorset R.); Oct. 3rd.

The initials of Lieut. J. F. Shaw (Qmr. and Lieut., R.E.) are as now stated, and not as in *Gazette* Aug. 16th.

J. B. Slater is granted a temp. commn. as Sec. Lieut., and to be Temp. Lieut. while specially employed; Sept. 18th.

The following are granted temp. commns. as Sec. Lieuts. — J. C. Bain (Temp. Lieut., E. York R.), and to be Hon. Lieut.; Aug. 22nd. E. Winter (Temp. Sec. Lieut., Labour Corps); Sept. 3rd. B. J. Crewe (Sec. Lieut., Oxf. and Bucks L.I.); Sept. 17th. G. Dolley (Hon. Sec. Lieut., R.A.F.), R. Lyne, A. Milne, J. H. Payne, J. Witton; Oct. 10th. J. Fisher (Lieut., S.A. Forces), and to be Hon. Lieut.; Oct. 12th. F. T. Wickwar; Oct. 14th.

The date of appointment of the following Sec. Lieuts. is Sept. 16th and not Sept. 14th, as in *Gazette* Sept. 20th: — T. R. Davies, F. A. Pritchard, W. C. van Eeden, A. F. Rees, W. Andrews, A. H. Warriner, W. C. Brown, H. E. Haddon, W. C. Cranfield, H. W. F. Long, J. S. Begg, H. J. De Waal, W. H. Hitt, W. Vaughan, J. O. Miles, C. W. Grey, G. G. Kirby, T. Mattocks, R. M. Balston, C. Jones, R. O. Griffith.

Capt. F. S. Farlow (Lieut., R.N.) relinquishes his commn. on ceasing to be employed; Sept. 25th.

Lieut. J. B. Ackroyd relinquishes his commn. on account of ill-health contracted on active service, and is granted the hon. rank of Lieut.; Oct. 16th.

Lieut. T. S. L. Mann relinquishes his commn. on account of ill-health, and is granted the hon. rank of Lieut.; Oct. 16th.

Sec. Lieut. J. G. Newton resigns his commn. and is granted the hon. rank of Sec. Lieut.; Oct. 16th.

The following Sec. Lieuts. relinquish their commns. on account of ill-health and are granted the hon. rank of Sec. Lieut. — E. Whitfield, G. M. V. Ventura, A. H. Pearson; Oct. 16th.

#### Technical Branch.

Majs. to be Temp. Lieut.-Cols. whilst employed as Lieut.-Cols. — A. E. G. MacCullum, J. McCrae, M.B.E.; July 12th.

Capt. M. Keegan to be Temp. Maj. while employed as Maj.; Sept. 1st.

Capt. A. C. Williams to be Temp. Maj. while employed as Maj.; Sept. 25th.

Capt. W. R. Abbott to be Capt., from (O.); Sept. 9th.

Lieut. (actg. Capt.) G. S. Hallas to be Temp. Capt. while employed as Capt.; Sept. 16th.

Lieuts. to be Lieuts. — T. D. H. Silver, from (O.); Aug. 24th. F. E. White, from (Ad.); Aug. 26th. J. Fleming (from O.); Aug. 29th. W. F. Mytton, from (A.); Aug. 31st. H. E. Hall, from (O.); J. M. R. E. St. Amory, from (A.); Sept. 7th. L. Marsh, from (O.); Sept. 13th. E. D. Aldridge, from (A.); Oct. 7th.

Sec. Lieut. P. H. Morrish to be Temp. Lieut. while employed as Lieut.; Oct. 2nd.

Lieuts. (A.) to be Lieuts. — L. W. Osman; June 18th. J. T. Thornhill; Aug. 22nd. D. J. A. O'Brien; Aug. 26th. R. G. Hugill; Aug. 29th. T. S. Griffins; Sept. 24th.

Lieuts. (Obsvr. Officers) to be Lieuts. — J. G. Proger; Aug. 26th. P. N. Shore; Aug. 29th.

H. L. Templer (Temp. Maj., A.S.C.) is granted a temp. commn. as Maj.; April 1st.

R. Thynne (Temp. Lieut., A.S.C.) is granted a temp. commn. as Lieut., and to be Temp. Maj. while holding a special appointment at the Ministry of Munitions; April 1st.

The following are granted temporary commns. as Capts. — C. E. Elliott (Capt., Hamps. R., T.F.), W. Calder (Temp. Lieut., R.E.); April 1st.

The following are granted temporary commns. as Lieuts (April 1st), and to be Temp. Capt. while holding a special appointment at the Ministry of Munitions: — L. F. Buckingham (Temp. Sec. Lieut., attd. R. Fus.), F. E. Moccatta (Capt., R.F.A., S.R.), A. W. Pine (Lieut., Essex R., T.F.), F. E. Reiss, M.C. (Temp. Lieut., attd. R. Fus.), G. V. Stringer, M.C. (Lieut., R.F.A., T.F.); May 24th.

W. J. Palmer (Temp. Lieut., Gen. List, New Armies) is granted a temporary commn. as Sec. Lieut. (April 1st), and to be Temp. Capt. while holding a special appointment at Ministry of Munitions; May 24th.

Sec. Lieuts. to be Sec. Lieuts. — A. J. Evans, from (Ad.); Aug. 22nd. H. Hayter, from (Ad.); Sept. 7th. (Hon. Lieut.) R. E. Moore, and to be Hon. Lieut., from (Ad.); Sept. 10th.

Sec. Lieut. E. Hattemore (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lieut.; Sept. 16th.

J. E. Koefod, Prob. Flt. Off. (late R.N.A.S.), is granted a temp. commn. as Sec. Lieut.; Oct. 10th.

The following are granted temp. commns. as Sec. Lieuts.: — H. P. Northcote (Lieut., W. York R., S.R.), and to be Hon. Lieut.; Aug. 24th. W. R. C. Hodge (Lieut., Kent Cyclist Corps, T.F.), and to be Hon. Lieut.; Aug. 26th. E. R. Loder (Capt., Bedf. R., S.R.), and to be Hon. Capt.; Sept. 9th. A. J. D. Henry (Lieut., R.F.A., S.R.), and to be Hon. Lieut.; Sept. 12th. W. Randell (Lieut., Middx R., T.F.), and to be Hon. Lieut.; Sept. 28th.

Lieut. (Hon. Capt.) J. W. G. Mackinlay relinquishes his commn. on account of ill-health, and is granted the hon. rank of Capt.; Oct. 16th.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are granted the hon. rank of Sec. Lieut. — H. M. Temple, H. F. Farr; Oct. 16th.

Sec. Lieut. A. McD. Hamilton resigns his commn.; Oct. 18th.

#### Medical Branch.

J. MacLaughlin (Lieut.-Col., ret., R.A.M.C.) is granted a temp. commn. as Capt., and to be Hon. Lieut.-Col.; Oct. 14th.

The following are granted temp. commns. as Lieuts. — F. S. Drewe; Oct. 11th. A. Henderson; Oct. 14th.

#### Dental Branch.

The following are granted temp. commns. as Lieuts. — A. E. F. Peaty, F. J. Bradburn; Oct. 11th.

#### Memoranda.

Maj.-Gen. M. E. F. Kerr, C.B., M.V.O., relinquishes his commn. on ceasing to be employed; Oct. 14th.

Capt. J. H. Vickers to be Actg. Maj. (without the pay and allowances of that rank) whilst specially employed; Sept. 6th.

F. Hudson is granted a temp. hon. commn. as Capt.; Oct. 15th.

*London Gazette*, October 18th.

The following temporary appointment is made at the Air Ministry: — Staff Officer 3rd Class.—Capt. J. P. Cherry vice Capt. G. C. Braithwaite; Sept. 1st.

The following temporary appointments are made: —

Staff Officers 3rd Class.—R. G. Parry D.S.O. (Eng.-Lieut. R.N.) and is granted a temp. commn. as Capt.; July 4th. Lieut. L. C. Bygrave, and to be Temp. Capt. while so employed; July 7th.

Staff Officer 4th Class (1st Grade).—Lieut. S. J. Stocks, and to be Temp. Capt. while so employed; Oct. 1st.

Staff Officer 4th Class (2nd Grade).—Lieut. (Hon.-Capt.) G. MacD. Turner; Oct. 16th.

#### Flying Branch.

Lieuts. to be Temp. Capt. while employed as Capts. — P. B. O. L. B. de Morency; Aug. 1st. P. Grossett, R. C. Cain, D.F.C., R. T. Minors; Oct. 7th. J. S. Hervey; Oct. 8th. S. W. Highwood; Oct. 9th 1914. G. R. Riley, J. P. Findlay; Oct. 14th.

Sec. Lieut. V. H. Hervey to be Temp. Capt. while employed as Capt.; Oct. 8th.

Lieut. W. R. S. Humphreys to be Lieut. from (T.); Oct. 10th.

The notification in *Gazette* of Oct. 1st concerning Lieut. J. V. Turner is cancelled.

Lieut. (Hon. Capt.) W. G. B. Marti, M.C., to be Lieut. (A.), and to be Hon. Capt., from Obs. Officer; Aug. 10th.

The following Lieuts. (Obs. Officers) are confirmed in their rank as Lieuts. (A.): — L. R. B. Spence; July 2nd. J. B. Weiss; July 4th. H. J. P. Bomford; July 22nd. L. C. Bailey; July 23rd. P. P. Butters; Aug. 4th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (A.): — V. M. Mitchell; July 30th. B. Rogers; Aug. 8th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A.): — E. R. Stockport; Sept. 21st. W. G. Fleming, J. Dwerryhouse; Sept. 23rd. E. Wilcox; Sept. 25th. W. J. Delaney, W. J. Bixell; Sept. 26th. F. W. Leach; Sept. 28th. T. T. Williams; Oct. 1st. R. S. Wreathall, E. G. Breed, P. R. Blythe, G. C. F. Ely, P. H. Davies; Oct. 3rd. C. R. Curry, H. S. Rowland, F. H. Brewitt; Oct. 4th. W. De W. Atkinson, L. C. Mullins, G. W. Thornton-Inman, E. H. Peet; Oct. 5th.

The following are granted temp. commns. as Sec. Lieuts. (A.): — G. R. Wright (Sec. Lieut., Hamps. R., T.F.); July 17th. G. E. Clavey (Lieut., R.F.A.), and to be Hon. Lieut.; July 21st. P. Bailey (Temp. Lieut., High. L.I., S.R.), and to be Hon. Lieut.; July 30th. C. E. Turner (Temp. Capt., Worc. R.), and to be Hon. Capt., R. R. Thompson (Temp. Lieut., M.G. Corps), and to be Hon. Lieut.; July 31st. S. P. Pattison (Lieut., Lond. R., T.F.), and to be Hon. Lieut., T. P. Robinson (Temp. Lieut., R. Dub. Fus.), and to be Hon. Lieut.; Aug. 5th. E. P. Blackmore (Temp. Sec. Lieut., Lan. Fus.); Aug. 6th. Flight Cadet A. Ingram is granted a temp. commn. as Sec. Lieut. (A. and S.); Aug. 31st.

The following are granted temp. commns. as Sec. Lieuts. (K.B.): — C. J. E. Malet-Veale (Lieut., R.F.A., S.R.), and to be Hon. Lieut., T. W. Woodrow (Sec. Lieut., R.F.A.); June 17th.

The surname of Sec. Lieut. L. S. Eckert is as now described and not as in *Gazette* June 18th.

The surname of Sec. Lieut. P. R. Davis is as now described and not as in *Gazette* June 18th.

The Christian name of Flight Cadet Thomas Lowes Calvert is as now described and not as in *Gazette* Sept. 24th.

The following officers are antedated in their appointments as Sec. Lieuts. (A. and S.), with effect from the dates stated: — W. Campbell; April 5th. J. V. Flanagan; June 23rd. F. C. Annett; July 10th. S. Campan; July 15th. C. Davidson; July 30th.

Lieut. L. Wycherley to be Lieut. (Obs. Officer) from (A.); July 21st.

Sec. Lieut. S. D. Evans (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lieut. (Obs. Officer); July 20th.

The following Prob. Obs. Officers (late R.N.A.S.) are granted temp. commns. as Sec. Lieuts. (Obs. Officers): — J. H. Spracklin; Sept. 20th. G. M. Butters; Sept. 30th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (Obs. Officers): — S. King; July 20th. R. A. Hacking, H. V. Stevens, F. H. Snoxell, O. F. Harrison, W. G. Lowcock, O. Matthews, A. J. Bonar, E. T. Sutherland; Oct. 4th. A. H. Taylor; Oct. 5th. W. C. Aitchley, J. H. Bradbury, W. L. Beck, A. S. McNaught, J. Mortimer, J. Mitchell, T. L. Oliver, H. W. Robinson, C. Shaw, W. J. Sutherland, A. R. H. Young; Oct. 7th. F. H. H. White, A. Makins, C. T. Halliday, J. W. Gardiner, F. Heath, F. L. P. Smith; Oct. 8th. J. R. Guthridge, W. W. MacCharles, H. G. McEwan, R. V. Dowding, W. J. G. Godden, W. E. De Turberville, F. T. Hewitt, C. Hargreaves, F. W. Smith, W. R. Forster, C. Mackay, A. C. Maynard; Oct. 10th.

The following are granted temp. commns. as Sec. Lieut. (Obs. Officers): — O. C. Dawson (Temp. Sec. Lieut., R.E.); May 1st. A. J. Stevens (Temp. Sec. Lieut., R. War R.); July 1st. H. R. Owen (Temp. Sec. Lieut., Rifle Brig.); July 3rd. T. Comrie (Temp. Lieut., Gord. Highrs.), and to be Hon. Lieut.; July 25th. R. C. Campbell (Lieut., Som. L.I., T.F.), and to be Hon. Lieut.; Aug. 6th. R. A. Blake (Temp. Lieut., R.F.A.); and to be Hon. Lieut.; Aug. 10th. P. W. Watson (Sec. Lieut., W. York R., T.F.), R. B. Williamson (Temp. Sec. Lieut., R. Suss. R.), D. C. Simpson (Temp. Sec. Lieut., K.R. Rif. C.), W. O'B. Rigden (Lieut., Oxf. and Bucks L.I., T.F.), and to be Hon. Lieut., P. G. Hutson (Temp. Lieut., Middx R.), and to be Hon. Lieut., E. L. Hallett (Sec. Lieut., R. Suss. R., T.F.), F. J. Smith, M.C., M.M. (Sec. Lieut., R. Berks. R.), R. M. Colebrook (Capt. Hamp. R., S.R.), and to be Hon. Capt., F. L. Bax (Sec. Lieut., R.F.A., S.R.), S. E. Foreman (Temp. Sec. Lieut., North'd. Fus.), H. Knight, M.C. (Temp. Sec. Lieut., W. York R.), H. Lancaster (Sec. Lieut., N. Lan. R., T.F.), R. T. Smith (Lieut., C. Ont. R., C.E.F.), and to be Hon. Lieut., C. W. J. Lawrence (Temp. Sec. Lieut., S. Lan. R.), E. G. Lunn (Temp. Lieut., Norf. R.), and to be Hon. Lieut., M. W. White (Temp. Sec. Lieut., Middx R.); Sept. 28th. D. Martin (Temp. Sec. Lieut., North'd. Fus.), E. Bower (Temp. Sec. Lieut., Lan. Fus.), R. Riffkin (Temp. Sec. Lieut., Manch. R.), H. B. Smith (Sec. Lieut., Glouc. R., T.F.), A. K. Robinson (Temp. Sec. Lieut., attd. York and Lan. R.), H. J. Rayment (Temp. Sec. Lieut., Norf. R.), G. E. Moore, M.C. (Temp. Sec. Lieut., R. Fus.), P. Cartwright (Temp. Sec. Lieut., Yorks L.I.); Sept. 30th. J. C. Pritchard (Sec. Lieut., R. W. Kent, R., T.F.); Oct. 1st. V. Rose (Temp. Sec. Lieut., R.E.); Oct. 4th. P. R. Tuckwell (Temp. Lieut., Devon R.), and to be Hon. Lieut.; Oct. 7th. A. A. Turvey (Temp. Sec. Lieut., Notts and Derby R.); W. Morrison (Lieut., Manitoba R., C.E.F.), and to be Hon. Lieut., T. S. Duddy, D.C.M. (Sec. Lieut., Durh. L.I.); Oct. 9th. H. Vanstone (Temp. Sec. Lieut., R.E.); Oct. 13th.

The notification in *Gazette* July 19th concerning Sec. Lieut. H. R. Owen is cancelled.

Maj. E. J. E. Hawkins (Capt., Ind. Army Res. of Off.) relinquishes his commn. on ceasing to be employed; Oct. 7th.

The following relinquish their commns. on account of ill-health contracted on active service: — Capt. (Hon. Maj.) K. E. Kennedy (Maj., C.F.A., C.E.F.), Capt. E. C. Sheppard (Saskatchewan R.); Oct. 19th.

Lieut. (Temp. Capt.) F. B. Scullard (Capt., Quebec R., C.E.F.) relinquishes his commn. on ceasing to be employed; Sept. 25th.

Lieut. G. E. Norman (Lieut., R. Ir. Rif., S.R.) relinquishes his commn. on ceasing to be employed; Sept. 30th.

Lieut. M. L. Hatch (Lieut., R.F.A., S.R.) resigns his commn. to resume his medical studies; Sept. 21st.

Sec. Lieut. (Hon. Lieut.) W. J. Bourne relinquishes his commn. on account of ill-health contracted on active service and is granted the hon. rank of Lieut.; Oct. 19th.

The following Sec. Lieuts. relinquish their commns. on account of ill-health contracted on active service and are granted the hon. rank of Sec. Lieuts. — M. A. K. Carpenter, C. N. Crofton-Sleigh; Oct. 19th.

*Administrative Branch.*

Sec. Lieut. (Temp. Lieut.-Col.) W. C. Bersey to relinquish the temp. rank of Lieut.-Col. and to be Temp. Maj. whilst employed as Maj. from (S.O.); Sept. 30th.

Lieut. R. L. G. May to be Temp. Capt. whilst employed as Capt.; Oct. 9th.  
Lieut. A. W. R. Matthews to be Temp. Capt. (without the pay and allowances of that rank) whilst employed as Adj't.; Oct. 2nd.

Lieuts. to be Lieuts.—H. A. Birks from (A.); April 18th. H. Delaney; June 4th. H. V. Jerrard from (A.); June 24th. H. C. Vickery from (O.). A. S. H. O'Brien from (O.); July 13th. J. E. R. Hyson from (A.); July 17th. (Hon. Capt.) W. J. Bailey from (A.); Aug. 16th. C. C. Matthews from (A.); Aug. 20th. W. O'Toole from (O.); Sept. 9th. (Hon. Capt.) H. W. Hepburn, from (A.); Sept. 13th. H. Brooks from (O.); Oct. 1st. I. G. Hall from (O.); Oct. 5th. C. E. Crowley from (A.); Oct. 7th. M. J. Fenwick from (A.); Oct. 11th. G. J. Frost from (A.); Oct. 25th. Sec. Lieut. H. A. Plater to be Lieut. whilst employed as Lieut.; Oct. 10th.

The notification in *Gazette* of Oct. 4th concerning Lieut. F. R. Hunt is cancelled.

W. G. Courthope (Capt. Bedf. R., T.F.) is granted a temp. commn. as Capt.; Sept. 17th.

The following are granted temp. commns. as Lieuts.—H. E. Wild (Temp. Lieut., Welsh R.); Aug. 17th. W. D. Hogarth (Temp. Lieut., S.List); Sept. 19th. H. S. Weston (Temp. Lieut., S.List); Sept. 20th. H. G. Mitchell (Lieut., Hrs.); Oct. 6th. H. S. Sellicks (Qmr. and Capt., Midddx. R.), and to be Hon. Capt. E. King (Lieut., R. Ir. R.); T. J. H. Fryer, M.C. (Temp. Lieut., K.R.R.C.); H. G. Whyte (Temp. Capt., R. Ir. Fus.), and to be Hon. Capt.; Oct. 8th. J. G. Macksey (late Sec. Lieut., Midddx. R.) is granted a temp. comm. as Sec. Lieut., and to be Temp. Lieut. whilst specially employed; Aug. 1st. (In substitution of notification in *Gazette* Aug. 2nd.)

The following are granted temporary commissions as Sec. Lieuts.—E. A. Burridge (Temp. Sec. Lieut., Yorks. L.I.); July 18th. S. F. A. Welsh (Temp. Sec. Lieut., T.R. Bn.); July 21st. J. W. S. Appleton W. Butler (Qmr. and Hon. Lieut., Worcs. R.), and to be Hon. Lieut. S. Dickson (Lieut., Ret. List, T.F.), and to be Hon. Lieut., A. J. Green, A. J. Higgins, L. B. Hobgen, E. A. Jones-Stewart (Hon. Lieut., Ret. List) and to be Hon. Lieut., R. D. Thomas (late T. Lieut., Worcs. R.), and to be Hon. Lieut.; Oct. 16th.

Capt. T. H. Martin relinquishes his commn. on account of ill-health contracted on active service and is granted the hon. rank of Capt.; Oct. 19th.

Sec. Lieut. C. H. Pares relinquishes his commn. on account of ill-health contracted on active service and is granted the hon. rank of Sec. Lieut.; Oct. 19th.

Sec. Lieut. C. F. Jackson relinquishes his commn. on account of ill-health and is granted the hon. rank of Sec. Lieut.; Oct. 19th. The following Sec. Lieuts. resign their commns.—N. J. B. Hugo, J. M. Largesse; Oct. 19th.

*Technical Branch.*

Sec. Lieut. (Temp. Lieut.) A. H. Dawson to retain the temp. rank of Lieut. while employed as Lieut. from Ad.; Aug. 16th.

## AIRCRAFT WORK AT THE FRONT.

### OFFICIAL INFORMATION.

**British.**
*Headquarters R.A.F., Independent Force, October 15th.*

"Thick mists, clouds, and rain made any operations practically an impossibility, but in spite of these conditions we attacked Frescaty aerodrome. One bomb was dropped from a height of 40 ft., through the roof of the Zeppelin shed, blowing all the windows out, and another bomb was dropped on a hangar wrecking it. Mechanics ran out on hearing the explosions, and were promptly machine-gunned, several casualties being caused. Ground defences were apparently surprised, as no attempts were made to open fire until the attack was over. We had no casualties."

*General Headquarters, October 15th.*

"On October 14th fine weather enabled our squadrons to maintain the greatest activity throughout the day. Much valuable reconnaissance and photographic work was completed, and many targets were reported to our artillery. Our bombing machines caused great damage to railway stations and junctions in rear of the enemy's lines. Many direct hits were obtained and numerous fires started in railway sheds. Parties of enemy troops and transport were also attacked, and a hangar on an enemy aerodrome was set on fire. In all, 33 tons of bombs were dropped by us. German aeroplanes showed intense activity on the northern battle front, and heavy fighting ensued. Thirty enemy machines were destroyed and six driven down out of control. In addition one enemy machine was shot down by our anti-aircraft guns, and one by machine-gun fire from our infantry. One German balloon was shot down in flames. Eleven of our machines are missing. After dark our night-flying squadrons continued to attack railway junctions with good effect, dropping over 13 tons of bombs."

*Admiralty, October 15th.*

"Operations of Royal Air Force contingents working with the Navy, in co-operation with the Belgian offensive, during the period October 6th-12th, have been considerably hampered by unfavourable weather. Fourteen tons of bombs have been dropped on enemy lines of communication, railway junctions, dumps, &c., and the ports of Ostend, Zeebrugge, and Bruges have been kept under continual observation by aerial reconnaissance. Enemy activity has been below the normal. Eight enemy machines have been destroyed and four driven down out of control, whilst two of our machines are missing."

*General Headquarters, October 16th.*

"On the 15th inst., in spite of very unfavourable weather conditions, our squadrons continued their activity over the battle front. Close co-operation was maintained with our infantry and artillery, and reconnaissance and photographic work was also accomplished. Over 10 tons of bombs were dropped on railways and centres of hostile activity. The enemy's troops and transport were harassed by machine-gun fire from the air. In air fighting, one German machine was destroyed. All our machines have returned. Owing to weather conditions, no night operations were possible."

*War Office, October 16th.*

"*Palestine Front.*—Our advanced cavalry and armoured cars also occupied Tripoli (October 13th) and Homs (October 15th) without opposition, the latter town having been reported by our air service as evacuated, and in flames on October 12th."

*Headquarters R.A.F., Independent Force, October 17th.*

"Owing to thick mists and rain no operations have been possible since Oct. 11th."

*General Headquarters, October 17th.*

"On October 16th low clouds and thick mist made continuous operations in the air impossible, but at intervals, when the mist lifted, our contact machines kept touch with our advancing troops, and our low-flying machines harassed the enemy. Hostile aircraft showed no activity, and no air fighting took place. All our machines have returned."

*Admiralty, October 17th.*

"Royal Air Force contingents working with the Navy landed in Ostend this morning, and report it clear of the enemy. Vice-Admiral Sir Roger Keyes,

T. M. Dutton is granted a temp. commn. as Capt.; Oct. 16th.

Capt. F. D. Maclean (Capt., R.F.A.) relinquishes his commn. on ceasing to be employed; Sept. 17th.

Lieut. J. N. Scovell relinquishes his commn. on account of ill-health and is granted the hon. rank of Lieut.; Oct. 19th.

Sec. Lieut. (Hon. Lieut.) D. H. Robinson (S. Staff. R., T.F.) is removed from the Royal Air Force; Aug. 31st.

*Medical Branch.*

H. A. Hewat (late Temp. Surgn., R.N.) is granted a temp. commn. as Capt.; Sept. 5th.

T. D. J. A. Fuller is granted a temp. commn. as Lieut.; Oct. 17th.

*Memoranda.*

Lieut.-Col. (Temp. Col.) Hon. W. F. Forbes-Sempill (Master of Sempill A.F.C.) relinquishes the appointment of Dep. Dir. and retains his temporar rank while specially employed at the Ministry of Munitions; Oct. 8th.

J. P. Cherry (Qmr. and Capt., Durh. L.I.) is granted a temp. commn. as Capt.; May 18th.

*Royal Flying Corps (Military Wing).*
*London Gazette Supplement, October 15th.*

*Flying Officers.*—Temp. Lieut. R. G. B. Nixon, M.G. Corps, and to be transfd. to R.F.C. Gen. List; Oct. 24th, 1917. Temp. Capt. (Qmr. and Lieut., R.A.M.C., T.F.) A. W. Beaman, from A.S.C., and to be Temp. Capt., R.F.C. Gen. List; Jan. 29th

*London Gazette Supplement, October 17th.*

*Assistant Instructors in Gunnery.*—(Graded as Equipment Officers, 2nd Class, from Asst. Instrs. in Gunnery (graded as Equipment Officers, 3rd Class).—Temp. Lieut. R. C. Graham, Gen. List; Feb. 1st. Lieut. E. G. Seth-Smith, E. Surr. R., S.R. And to be Temp. Lieuts. while so employed:—Temp. Sec. Lieut. J. L. V. Bullimore, Gen. List; Temp. Sec. Lieut. H. St. C. Roy, M.C., Gen. List; March 1st.

*Depot Commander.*—Capt. (Temp. Maj.) H. B. T. Childs, S.R., from a Park Comdr., and to be Temp. Lieut.-Col. while so employed; Dec. 14th, 1917.

*Calvary.*

*Remt. Serv.*—Capt. F. D. Alexander, Hrs., S.R., to be a Dep. Asst. Dir. of Remts. (temp.), and to be Temp. Maj. while so employed; Sept. 27th.

*London Gazette Supplement, October 19th.*

*Schools of Instruction.*—*Schools of Aerial Gunnery.*  
*Instructor in Gunnery.*—(Graded as an Equipment Officer, 1st Class).—Lieut. A. W. Phillips, M.C., R. Fus., S.R., from an Asst. Instr. in Gunnery (graded as an Equipment Officer, 2nd Class), and to be Temp. Capt. while so employed; Jan. 25th.

commanding the Dover Patrol Force, landed at Ostend at 12.55 this afternoon."

*General Headquarters, October 18th.*

"On October 17th, in spite of adverse weather conditions, our squadrons were active along the whole front. Many reconnaissances were carried out and photographs taken. Close touch was kept with our advancing troops, and their movements were reported to the Headquarters concerned. The enemy railway centres behind the northern battle front were attacked with heavy bombs, and on all fronts his troops were harassed with light bombs and machine-gun fire, a total of 9½ tons of bombs being dropped by us. There was very little activity on the part of the enemy's aircraft. One German machine was destroyed in air fighting. One of our machines is missing. No night operations could be carried out on account of thick mist."

*General Headquarters, October 19th.*

"On October 18th flying operations were again greatly handicapped by low clouds and thick mist, but our machines continued their activity, and accomplished some reconnaissance and photographic work. A very successful attack was carried out from a low altitude on Tournai junction, and on troops transport, and German aerodromes in the vicinity. An ammunition train was blown up and set on fire from end to end, another train received four direct hits, and a large explosion was caused in the station. Hangars at two aerodromes were set on fire, transport columns were hit, and many casualties were caused to enemy troops by machine-gun fire. During the day over six tons of bombs were dropped by us. German aeroplanes showed very little activity throughout the day. In air fighting, three of the enemy's machines were shot down and two were driven down out of control. In addition, one hostile machine was shot down in our lines by rifle fire from our infantry. Two of our machines are missing. In spite of the thick mist, some of our night-bombing machines succeeded in dropping 3½ tons of bombs on railways on the enemy's lines of communication, obtaining direct hits on sidings and permanent way. All these machines have returned."

*Headquarters R.A.F., Independent Force, October 19th.*

"On the afternoon of the 18th inst. our machines attacked the railways at Metz-Sablon. Observation was difficult, but bursts were observed on the railway workshops and in the railway triangle. All our machines returned. On the night of the 18th-19th inst. the railways at Saarburg were attacked. Weather conditions were very bad and results could not be observed. We had no casualties."

*General Headquarters, October 20th.*

"The present spell of bad weather continued throughout October 19th, and operations could only be carried out under great difficulty, but, flying in mist, cloud, and rain, our pilots completed some valuable reconnaissance and contact patrol work, and succeeded in taking some photographs. Over 7 tons of bombs were dropped on railway stations behind the northern battle front and on the enemy's troops and transport. There was little activity on the part of hostile aircraft, and no air fighting took place. One of our machines is missing. No night operations could be carried out on account of the weather conditions."

*General Headquarters, October 21st.*

"On October 20th some of our machines successfully accomplished low-flying reconnaissances and contact patrols, dropping a few bombs and firing with machine-guns on enemy troops while doing so. Weather conditions prevented all further operations. All our machines have returned."

*Headquarters R.A.F., Independent Force, October 21st.*

"On the afternoon of the 21st inst. our machines bombed the railways at Tainoville. Direct hits were obtained on the lines. In the course of fighting one enemy aeroplane was driven down out of control. All our machines returned."

*Headquarters R.A.F., Independent Force, October 21st.*

**French.**

"Numerous aeroplanes landed on the Ostend Plage."

*Paris, October 17th.*

*Paris, October 18th.*

"On October 15th Sub-Lieut. Haegelin set fire to a captive balloon. This is the 20th victory of this pilot—12 balloons and eight aeroplanes."

*Paris, October 19th.*

"On October 18th, the activity of the German air squadrons being chiefly concentrated in the region from the Aisne to the Argonne, our aeroplane formations made for that region with the object of assuring the safety of the observation aeroplanes, the balloons, and the troops on the ground. Numerous aerial engagements were fought in this zone, in the course of which 13 German aeroplanes were shot down or fell driven out of control in their lines. In addition, on the Lorraine front our pilots attacked the captive balloon of La Bourdonnaye and that of Avricourt just as they were going up, and set fire to them. Observation aeroplanes, protected by chaser aeroplanes, carried out deep reconnaissances over the enemy's zone and brought back useful information about the concentrations of German troops north of La Fere and of the Aisne. The railway stations of Hirson, Liart, Rozoy-sur-Serre, Montcornet, and Vervins, where important troop movements were reported, received several visits from our squadrons. Over 14 tons of projectiles were utilised with excellent results, and violent explosions and fires were observed in the railway stations of Hirson and Rozoy as the result of the bombardment. On October 18th Sub-Lieut. Gugon shot down his 10th German aeroplane."

**SIDE-WINDS.**

LONG before the time when an aeroplane succeeded in what then seemed the hazardous adventure of crossing the English Channel the name of Bleriot had acquired a world-wide reputation. In those days Bleriot stood for excellence of sheet metal work as exemplified in head-lights and lamps for motor cars. That reputation has been steadily maintained by Bleriot, Ltd., and it is not altogether surprising—motor car lamps not being in such great demand to-day—that their craftsmanship has been turned to good use in producing articles more directly connected with help in to win the war, principally fittings and accessories for aircraft.

Here, in order to clear away a misconception which appears to exist in some quarters, it may be as well to emphasise the fact that Messrs. Bleriot, Ltd., whose London office is at 57, Long Acre, W.C. 2, is the original firm and that it has no connection with any other concern having a similar name. The fact that some little time ago an attempt was made by a notorious company promoter to exploit in another direction to his own benefit the honoured name of Bleriot is without doubt at the bottom of the idea in some of the public's minds that the laurels have been shifted to another head. Bleriot Ltd., are still, as they have been from the original inception, famous for such work as we have outlined above.

As to the excellence of the workmanship of Messrs. Bleriot, Ltd., we were afforded an opportunity the other day of seeing some of their products in the making, and so were enabled to see at first hand why they have built up such a splendid reputation for reliability and efficiency. It would be gratifying to us, and we are sure interesting to our readers, if we could

**The King and Escaped Prisoners**

IT was announced in the *Court Circular* of October 22nd that H.M. the King had received four officers who had escaped from custody in the hands of the enemy. They included Capt. E. W. Leggatt, of the Wilts Regiment and R.A.F., and Lieut. E. J. Bennett, of the R.A.F. His Majesty congratulated these officers on their restored freedom, and had an interesting talk with each as to his experiences in captivity.

**Extravagant Ways of Making Aerodromes**

SPEAKING at a meeting at Ongar the other day Mr. E. C. Pretyman answered criticisms passed on the Government regarding the high wages paid to men employed by contractors at aerodromes. It was alleged that high wages were paid because contractors' payments were based on the wages bill. This, it was said, drew men from the land and caused great discontent in rural districts.

Mr. Pretyman said the Government were aware of the difficulty, and had received numerous complaints, but the position was not easy to remedy. The condition of the labour market was so variable that contractors would not accept contracts at a lump sum. The Admiralty were trying to get over the difficulty in this way: In letting contracts they undertook to repay the actual cost of labour and material, but the contractors' profit was limited to a lump sum. He hoped this would do away with the incentive to spending unnecessary money on labour and material.

**British Columbia's Aero Spruce**

IN an official communication the Attorney-General for British Columbia states that in January last the aero spruce production of the Province was 150,000 ft. board measure. In August, however, it had reached 3,000,000 ft. board measure. These figures refer to the logs shipped—the gross board measure cut amounting to 30,000,000 ft. board measure,

*Paris, October 17th.*

*Paris, October 19th.*

"Yesterday, our pursuit squadrons on the front of the First Army were engaged in 25 combats, in which 17 enemy machines were shot down. Our bombing units dropped 4½ tons of bombs on Buzancy, Bayonville and Rémonville."

**Belgian.**

"Last night our airmen successfully bombarded the enemy lines of communication. To-day aerial activity was hampered by atmospheric conditions."

*Havre, October 15th.*

"During the night of October 19th-20th an enemy aeroplane was brought down by our machine-guns."

**Italian.**

"After a long period of inaction, due to the bad weather of the past three weeks, in the zone of operations, our aeroplanes were able temporarily to display certain activity. Enemy troops and wagons were machine-gunned with satisfactory results. A captive balloon was destroyed to the north-west of Oderza."

*Rome, October 19th.*

"Along the remainder of the front desultory artillery actions and a few aeroplane flights, hindered by the adverse atmospheric conditions."

**Serbian.**

"One German aeroplane has been brought down beyond our lines by rifle fire."

*Corfu, October 16th.*

"The German aeroplanes are bombing Nish."



give chapter and verse, but in these times Dora bids us be discreet. We may, however, venture to say that Bleriot products of to-day more than maintain the high standards of yesterday, and augur for still higher standards for tomorrow.

AN interesting ceremony took place at Sheffield on October 17th, when Mr. Davison Dalziel, M.P., chairman of Messrs. W. S. Laycock, Ltd., opened an addition to the works. A large number of guests and the whole of the staff and workpeople assembled in the new premises, which were specially decorated, and much enthusiasm prevailed.

The extension, which was primarily required for the immediate needs of the country, is also designed to meet the situation which will probably arise on the cessation of hostilities.

Mr. Davison Dalziel said he was very proud to think that they were not merely actuated by commercial motives, but were all anxious to be doing their share towards defeating a brutal and unscrupulous enemy. They were now at the most critical stage of the war, and that was not the moment to give up one atom of energy and determination in order to destroy this ruthless enemy. He paid a well-deserved tribute to the splendid way in which his staff had worked for the erection and organising of this new factory, his reference to Mr. Hunter, the works manager, being received with cordial cheers from the employees. The whole proceedings passed off in excellent style, and there was every evidence of good feeling between employers and employed. In the evening a supper, concert and dance was held at the Cutlers' Hall.



and the proportion of the quality suitable for aeroplanes amounting to 10 per cent. of the whole.

**Aerial Mail in Panama**

WITH a load of U.S. mail, 9,500 dollars worth of applications for Liberty Bonds, an American Army aeroplane on Sunday morning made the first non-stop flight across the Isthmus of Panama from the Atlantic side to Balboa. According to a brief cable message the distance of 34 miles was covered in 34 minutes.

**A New Luminous Mineral**

FURTHER details will be awaited with interest of what is described as a substitute for radium, the discovery of which, according to a brief message from Golden, Colorado, has been announced by Dr. Richard N. Moore, of the U.S. Bureau of Mines. It is predicted that the new mineral—which has been called monethorium—will come into wide use for luminous aeroplane dials, compasses, gunsights, &c.

**Holland Dissatisfied with German Aeroplanes**

IT is stated by the *Telegraaf* that Holland had spent large sums of money on aeroplanes from Germany at a time when that country's military needs left her hardly any machines to spare. The result was that when the aeroplanes were delivered they were of an inferior quality and nearly useless.

**German Apology to Switzerland**

THE German Minister in Berne has informed the President of the Swiss Confederation that the German Government would severely punish those who were responsible for the outrage at Miecourt, when an observation balloon was shot down and the occupant killed, and unreservedly recognised its obligation to pay compensation for all damage. The President replied that he would await a written reply to the Swiss Government's note of October 8th.

## COMPANY MATTERS.

### The Aircraft Manufacturing Co.'s Issue.

THE British, Foreign and Colonial Corporation as early as October 17th gave notice that the offer of £250,000 seven per cent. short term notes of the Aircraft Manufacturing Co. having been over-subscribed, the subscription list was closed that evening. Applications, however, received by the following morning's post received consideration.

### Coventry Premier, Ltd.

THE Directors, in their accounts for the twelve months ended July 31st, 1918, state that owing to the war it has been impossible to obtain the audited accounts of the company's continental business (carried on in the area of hostilities) for the period now under review. The profit and loss account submitted, therefore, only shows the result of the English trading, and it must be borne in mind that the English side of the business has had to bear a large amount of expenses which otherwise would be borne by the business as a whole. The result shown on the profit and loss account, after providing therein for all working expenses, debenture interest, directors' remuneration, and bad and doubtful debts, is a profit for the period of £12,349 11s. This profit reduces the adverse balance on profit and loss account to £46,351 8s. 6d.

### Ransome and Marles Bearing Co., Ltd.

AT the annual meeting on October 17th of the Ransome and Marles Bearing Co., Ltd., the chairman, Mr. V. S. Woods, announced that the divisible profit of the concern, after writing off the whole of the formation expenses of the enlarged company and the sum of £1,681 15s. 11d.—the cost of the works canteen which was recently erected—was £15,535, and moved the payment of a dividend of 15 per cent. per annum, less income tax, on the paid-up ordinary capital of the company. He also reported that sales and output were steadily increasing, and that the board had every expectation that the full output of the present plant would be reached and even exceeded within a few months. Mr. Henry Marles, the managing director, who seconded the resolution, referred with pride to the great growth of the business and the excellent prospects ahead. He pointed out that the profit actually earned during the year was at the rate of 21.7 per cent. on the paid-up capital, and that during the past ten years the rate of profit had never been less than this. He stated also that in addition to setting up a high standard of quality and accuracy for "R. and M." bearings they had produced and patented machines and improvements in bearings which the directors believed likely to be of considerable value to the company.

### NEW COMPANIES REGISTERED.

FALCON AIRCRAFT CO., LTD.—Capital £10,000, in £1 shares. Acquiring an option to purchase the engineering business of the F.S. Engineering Co. carried on at 28, Kelvin Road, Highbury. First directors: R. T. Wallace, J. W. Jackson, C. Knott, C. L. Neil, H. Cotes, J. S. Rees and J. Chareboots. Secretary, C. Knott.

GRAMPUS ARMAMENT CO., LTD., 33-36, King William Street, E.C.—Capital £2,500, in £1 shares. Manufacturers of air, naval and military armament and equipment, machinery, &c. First directors: A. Hubbard and H. D. Harrod.

LONDON AND PROVINCIAL AERIAL SERVICES, LTD., 29A, Charing Cross Road, W.C.—Capital £100, in £1 shares. First directors: Lionel Phillips, W. H. Lewis and A. M. Willmott.

MAYROW INDUSTRIAL SYSTEMS, LTD., 39, Victoria Street, S.W.1.—Capital £10,000, in 5,000 preference shares of £1 each and 10,000 ordinary shares of 10s. each. Aeronautical and aircraft engineers, formerly carried on by James J. Mayrow as Aircraft Steel Construction Co., and the Rigid Airship Co., at 39, Victoria Street, S.W.1. First directors: J. J. Mayrow and W. T. Flegg.

TAPPETS, LTD., Advance Works, Kingsthorpe Road, Northampton.—Capital £5,000, in £1 shares. To acquire the business of manufacturers of wholesale and retail dealers in all descriptions of tappets used in connection with valves for aeroplanes, motor cars and motor cycles carried on by Gainsford, Power and Co., at Kingsthorpe Road, Northampton. First directors: D. H. Gainsford, J. C. Power, and J. H. Freborough.

WILLIAM VERNON AND SON, LTD.—Capital £10,000, in £1 shares. Acquiring the business of builders, shopfitters, &c., carried on at Chester and elsewhere as "William Vernon and Son"; also to carry on the business of flying machine manufacturers, &c. First directors:—A. W. Vernon, W. J. Vernon and A. J. Vernon.

### PUBLICATIONS RECEIVED.

*The Curtain of Steel.* By the Author of "In the Northern Mists." London: Hodder and Stoughton, Ltd. Price 6s. net.

*Buying Systematically.* By G. H. Mansfield. London: The Aircraft Supplies, Ltd., 125, Long Acre, W.C. 2. Price 2s. 6d. net.

### Catalogue.

*Fittings in Non-Ferrous Metals for Aircraft and the Air Forces.* Best and Lloyd, Ltd., Birmingham.

### Aeronautical Patents Published.

Abbreviations:—cyl. = cylinder; I.C. = internal combustion; m = motors.

#### Applied for in 1918.

- The numbers in brackets are those under which the specifications will be printed and abridged, &c.  
Published October 10th, 1918.
- 8,408. E. R. CALTHORP. Parachutes. (118,859.)
  - 8,410. E. R. CALTHORP. Safety-slings for use with parachutes. (118,860.)
  - 11,532. VICKERS, LTD., AND C. U. FLETCHER. Milling-cutters, &c. (118,872.)
  - 13,089. E. MCGRUER. Hollow spars, wooden tubes, &c. (118,883.)
  - 13,208. H. DREYFUS. Non-inflammable celluloid. (118,891.)
  - 15,638. D. J. MOONEY. Metal construction of planes and control surfaces of aircraft. (118,931.)

Published October 17th, 1918.

- 927. C. D. DOUGLAS. Engines for use in aircraft. (119,046.)
- 10,647. A. D. THOMPSON and W. N. GREEN. Gauge for indicating when bullet, &c., enters petrol tank, and safety valve combined. (119,054.)
- 15,358. F. J. COX. Sighting apparatus for bomb-dropping from aircraft. (119,127.)
- 18,462. C. BATES. Propulsion of aircraft. (119,161.)

Published October 24th, 1918.

- 10,099. C. S. WALKER. Framework of aeroplanes. (119,251.)
- 13,904. H. S. CUTHBERTSON. Cowling of aircraft engines. (119,280.)
- 16,927. J. J. MURRAY. Aeroplane bodies. (119,336.)
- 17,021. M. PHILLIPS and R. TEMPLE. Manufacture of hollow laminated articles of wood. (119,337.)
- 16,538. A. H. MIDGLEY and C. A. VANDERVELL. Percussion fuses for explosive projectiles. (119,329.)

#### Applied for in 1918.

The numbers in brackets are those under which the specifications will be printed and abridged, &c.  
Published October 10th, 1918.

- 2,073. E. BADGER. Leaflet-scattering bomb. (118,978.)
- 3,380. W. H. COTTON. Hydroplane vessels. (118,986.)
- 9,660. F. ATHIMON. Pliers for forming loops and eyes in aeroplane stays. (116,894.)
- 2,027. A. EVANS. Level-indicators for aircraft. (119,179.)

Published October 17th, 1918.

- 19. W. TAYLOR. Levels for aircraft. (119,364.)
- 997. S. E. SAUNDERS, LTD., and H. H. THOMAS. Screens for admission of air to radiators. (119,375.)

### NOTICE TO ADVERTISERS.

In order that "FLIGHT" may continue to be published at the usual time, it is now necessary to close for Press earlier. All Advertisement Copy and Blocks must be delivered at the Offices of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, not later than 12 o'clock on Saturday in each week for the following week's issue.

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages iv, vii, viii and ix).

## FLIGHT

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